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CLINICAL LECTURE.

THE ETIOLOGY OF CLUB-FOOT—THE TREATMENT OF CLUB-FOOT—THE PLASTER-OF-PARIS BANDAGE.

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Gentlemen:—I have had this baby, who was operated upon at our last meeting, brought before us to-day in order that you might see the character of the dressing employed, the condition of the foot now, and also the character of the appliance which we shall put on. I have had the plaster-of-Paris cast cut in such a way that it will be readily removed. Remember that we are simply putting the parts in a mechanical relationship so that there may result a correction of the deformity. The feet, you notice, are placed in a position of extreme eversion. The scar here is very small, the greatest amount of damage having been done beneath the cutaneous surface. Union has taken place by an exudation of plasma, which will become organized to form a new elongated tendon. But little force is required now to correct the deformity, but as soon as this force is relaxed, the deformity returns. Therefore is indicated the adoption of a form of treatment which will hold the feet in the corrected position. Subsequently, then, to the operation, comes in maintenance of the corrected position and finally the treatment proper of the deformity.

Time did not permit me to operate upon this second patient before you last week, but I performed the operation immediately after the hour, and bring him before you now that you may see the two patients together. You will see here also that when this plaster-of-Paris cast is removed from the foot, the latter immediately returns to its former position. Just here there is one point I would have you bear in mind. You will observe in those children who have normal feet, a position of *varus* which they assume when at rest. You must keep in mind the fact that the position of repose is that in which the foot is slightly inverted.

ETIOLOGY OF CLUB-FOOT.

Since my last lecture I have been asked several very pertinent questions which I have felt called upon to answer publicly rather than individually. One of these is, What produces these congenital deformities, or why do some children present the deformity, and others in the same family not? More time, probably, has been spent upon the study of the etiology of congenital club-foot than upon that of any other subject in orthopedic surgery. I will endeavor to place concisely before you the various theories which have been advanced, notably by our German confréres, to explain the origin of the condition. Among these theories is that of *heredity*. It is well-known that a child inherits certain traces and peculiarities from its parents. A father or mother with a defective part of his or her body, may have a child with a similar defect, or a parent with a constitutional taint of consumption or syphilis will give to the child a similar disease. In my practice, however, over thirteen years now, I know of but one case in which there was an hereditary club-foot, the child inheriting the deformity from its father, and here is a suggestion worthy of remembrance, namely, that it is stated as a result of investigation in nearly all cases where the club-foot is inherited, it comes from the father. This theory, therefore, is proved to be an unimportant one, since so very small a number of cases may be explained by it. Equally unimportant is the theory of *maternal influence* or impression. When a mother cannot explain satisfactorily a condition in her infant in any other way,

she will go back to her period of gestation and recall some influence which she can bring to bear upon the production of the deformity. Thus nævi are frequently referred by the mother to seeing some object which in a general way resembled the appearance of the nævi or some other equally improbable occurrence. Another theory which approaches nearer to the truth and is more satisfactory in its explanation, is that of *mechanical intra-uterine pressure*—pressure exerted in intra-uterine life. If we can think of a condition in which there is a pressure being brought to bear upon the fœtus, as for instance when there is insufficient liquor amnii we can conceive of the possibility of the feet being held in this position so long as to result in the deformity. This theory will explain the formation of *varus* and *calcaneum*, but I do not think it will explain the other forms which are encountered. Another theory, is that which is known as the *musculo-nervous* theory, because it claims there is some central lesion of the brain or cord, whereby the muscles of the extremities are paralyzed, resulting in the deformity. This does not cover the large number of cases, however, in which there is no paralysis or atrophy of the muscles to be found.

The theory of *arrested development*, I believe, is the only theory by which we can explain the etiology of the condition. By arrested development we may explain not merely the various orthopedic conditions, but the various other congenital defects and anomalies, such as the case that I discharged from the hospital yesterday, who had congenital club-feet, club-hands, and defective knee-joints. Club-foot is frequently associated with spina-bifida, club-hand, webbed fingers, hydrocephalus and other evidences of some arrest of development. This theory is the most satisfactory because it will not entangle you with the other theories with which you will be brought in contact in considering the other deformities of the body. Those who advocate the musculo-nervous theory, found their belief upon false grounds. I cannot believe that the atrophy which exists in adult life in many of these conditions has preëxisted to the deformity, but I do believe that it has followed it as the result of the deformity. This urges me to impress upon you the possibility of producing deformity in the efforts made to correct an existing deformity. If we take a foot in which there is a *varus*, and so bind it to completely restrain muscular action that it becomes a mass of immobility, as in the case of a Chinese lady's foot, we are producing a condition of atrophy of the muscles which may result in a deformity.

In this boy, who I now bring before you, you see applied in another form, a means of mechanical restraint. This apparatus is doing here what was done in the other cases by the plaster-of-Paris splints, but has, however, a possibility of motion, while the other exerted an absolute restraining power. There are a large number of cases of so-called acquired *varus*, developing after birth. The argument advanced in these cases, is that if paralysis will produce *varus* after birth, why not apply the musculo-nervous theory to the prenatal cases. This child will illustrate the condition found in a great many cases of corrected club-foot. There is danger of atrophy from misuse. You notice the diminished calf on one side, and the shortened, narrowed foot. On measuring the ankles from the fixed points of the malleoli I find there is an atrophy of the bones also. If this atrophy has been produced by the central lesion which caused the club-foot it will be a much more difficult condition to treat; if, however, it is due to our means of mechanical restraint, we will be able to correct it, and improve the muscular development of the limb. The other leg develops more rapidly, chiefly because it is free from any form of restraint. I have now very briefly indicated the etiology and will now endeavor to lay down a principle upon which to base

THE TREATMENT OF CLUB-FOOT.

I shall ask you to divide all of these cases, following an arbitrary division, into three grades. The *first* grade will include all cases of congenital *varus* in which the deformity is easily corrected without operation, the foot readily placed in a proper position, and readily maintained in this position. Naturally, the *second* grade is a degree beyond this, where the deformity is corrected with difficulty, and the corrected position is maintained with difficulty. The *third* grade includes those cases where the foot is so firmly fixed in the deformed position that it cannot be corrected at all, that is, without the intervention of surgical or mechanical measures. If we accept these three grades we shall be prepared to take the next step and apply the treatment. This, likewise, is divided into three positions: first, the correction; second, the maintenance of the corrected position; and, third, the application of measures to restore the normal mechanical action of the foot. On the ear-

liest possible moment at which you correct the deformity will depend the ultimate success of the operation. After this, the subsequent treatment will consist in the application of such forms of manipulations, electricity and gymnastic exercise as will develop the muscles of the limb.

PLASTER-OF-PARIS BANDAGE.

I have shown you one form of operation, I will now show you one form of maintenance apparatus. One of the most important adjuvants of the orthopedic surgeon is the plaster-of-Paris bandage, but I would impress upon you the fact that you do not employ the plaster-of-Paris for any therapeutic action it may have but solely as a mechanical agent. Often have I seen a plaster-of-Paris bandage worn by a patient for a long time after it has become broken and useless with the apparent idea that it was keeping away the disease. In the preparation of the plaster-of-Paris bandage it is well to remember first the material you are going to use. If we use the ordinary surgical roller bandage made of unbleached muslin we will encounter two serious objections. In the first place its meshes are so close that we cannot get sufficient plaster-of-Paris into it; and in the second place, it is non-absorbent. We may place a surgical bandage in water for some time and it will not absorb any. A material which I am very fond of using is a form of cheese-cloth from which the sizing has been removed. It has, as you see, wide meshes. Ordinary cheese-cloth is yellow, being unbleached, and if we attempt to use it we will find that it is non-absorbent. The material I use is called butter-cloth, and has been passed through a process which has removed the sizing so that it readily absorbs the water from the plaster. Butter-cloth is even preferable to crinoline, which is somewhat stiffer and hence unpliable. There are all sorts of ways of preparing a plaster-of-Paris bandage but I will show you only the method resorted to here. The butter-cloth comes in fifty yard pieces, one yard wide. With an ordinary carving knife a bandage of the proper width is cut off the end of the piece as it comes from the store. We have adopted in this Hospital a method of rolling the bandage by means of a box of small size, which I devised some years ago and it possesses the advantage of simplicity. Resting on the edges of the box, at one extremity is a movable diaphragm, and on this, by means of a spring, is arranged what is called, for want of a better name a "distributor." This holds the bandage down and smears in the plaster as the bandage passes under it. At the other extremity of the box is a crank-pin attached, and around this the bandage is rolled. The plaster-of-Paris is then placed on the top of the diaphragm in a sufficient quantity and the crank-pin being turned, the bandage is rolled with its meshes filled with the plaster. It is not essential that the bandage should look pretty. The shop-bandages are nice to look at, but are not as efficacious as these which are roughly made, the real beauty consists of its utility and not its appearance. A plaster-of-Paris bandage spoils from being kept, because the gypsum possesses hygroscopic properties and will absorb water readily from the atmosphere. We can avoid this by wrapping the bandage in waxed paper, which will keep it for a long time without any damage whatever. In using these bandages two points of great importance must be borne in mind. The first is to have salt ready, and the second is to have something to cover the part of the patient upon which the bandage is to be placed. The use of salt is essential as a hardening process and is used in the water in which the bandage is to be soaked. The time occupied for the setting of the bandage should not exceed that of the time of application. If we use hot water the setting takes place far more quickly, but its use tends to make the plaster brittle and less durable. If you apply the bandage directly to the skin the hair will be caught and the patient will suffer as a consequence and any bony prominences are apt to cause abrasions of the skin covering. Plaster-of-Paris contracts in cooling, and if the bandage be applied too tightly it will constrict the parts and may produce sloughing. If some covering for the skin is used, all this may be prevented and I have found that for this purpose a prepared lint best answers the purpose. It absorbs the moisture from the inner side of the plaster-of-Paris bandage and thus makes it set more quickly. In conclusion, one point must be remembered, and that is, never cover an entire extremity in applying one of these bandages. If you are bandaging a foot leave the toes uncovered so that you may see whether or not too much pressure is being exerted. You can then have an indicator constantly before you and the nurse. Any tendency to constriction manifested by imperfect circulation would be sufficient reason for the removal of the fixed dressing and its reapplication.

TOOTHACHE may be relieved by naphthalin, 5 grains, dissolved in chloroform, 1 dram.

COMMUNICATIONS.

FURTHER CONTRIBUTIONS UPON TUBERCULIN.*

BY PROF. R. KOCH,

BERLIN.

(Translated by Henry T. Brooks, M. D., and Wm. Vissimann, M. D.)

Since I introduced the substance known as tuberculin to the world, many experiments have been made to isolate the active principles contained in it, and to free it from other matters to which it was believed disturbing extraneous actions were to be attributed. For some time past I have also busied myself with similar experiments and will state the results which I obtained in the following report. As yet only preliminary contributions upon the work belonging here are at my command, and, according to my own researches, the question appears to me not yet ripe for discussion. I shall confine myself to a description of my own observations, and leave the elucidation of casual contradictions and the discussion of the results obtained by other observers to a later time.

A few experiments showed that the active principles of tuberculin did not belong to the alkaloid ptomain groups, but that it is a substance closely allied to the albuminous bodies, and it was questionable whether it would bear the manipulations usually employed in isolating such substances without being changed in its composition. I, therefore, so proceeded that after every chemical reaction, I tried the action of the product on the animal organism in order to convince myself whether the active principle itself was still present and, if this was the case, whether a complete or partial separation had been produced. Without a control following the researches step and step, one very easily loses the thread and falls into error.

Since in this case almost everything depends upon experiments on animals and upon the proper interpretation of the same, it will be necessary to go into the details of these more closely. Healthy guinea pigs, as I have already shown, may be given very large quantities of tuberculin without any particular action. These are, therefore, not to be used as a medium for testing its active principles. Tuberculous guinea pigs, on the other hand, react in a characteristic manner after comparatively small doses. However, it is not sufficient to inject just enough tuberculin into the animals to cause them to react in a manner in which we are accustomed to see tuberculous persons react, for the temperature exacerbations and the local symptoms in a guinea pig are not sufficiently marked to permit of a certain opinion of the action of a single tuberculin injection. There remains nothing except to give the animal a large enough dose to kill it. In guinea pigs which are tuberculous in a high degree, *i. e.* 8 or 10 weeks after inoculation, 0.01 gram of tuberculin is very often enough for this purpose. In animals with less advanced tuberculosis, 4 or 5 weeks after inoculation, a dose of from 0.2–0.3 gram is usually required. A dose of 0.5 gram kills without exception. Now, if we take animals that have been inoculated at least 4 weeks and inject 0.5 gram of tuberculin, or a corresponding amount of the substance obtained from the tuberculin, which is to be tried as to its effect, then we can conclude as to the presence or absence of the active substance accordingly as the animal dies or lives. Here we have an infallible reagent which, in several hundred experiments, has not up to the present time disappointed me in a single instance.

Further, the phenomena under which the tuberculous animals killed with tuberculin, die, are so characteristic that they cannot well be mistaken for those arising from an accidental cause of death. The animal dies according to the degree of tuberculosis, in from 6–30 hours. If death takes place sooner or later it cannot be positively attributed to the action of tuberculin. In my experiments I could show in all of these cases that death was caused by pneumonia, malignant œdema and other infectious diseases.

On the cadaver of a tuberculous guinea pig killed by tuberculin the following changes are found. On turning back the abdominal walls, the place of injection is very much reddened by the injections of the vessels; it often has a dark, almost violet color. This redness spreads out more or less into the surrounding tissues. The lymphatic glands in the neighborhood of the inoculation-point are very much reddened. The surfaces of the liver and spleen show, beside the tuberculous changes, spots up to the size of a hemp-seed which are deeply reddened and look exactly like ecchymoses which are found in many infectious diseases. Microscopical examinations of these points show that they

* From the *Deutsche Medicinische Wochenschrift*, No. 43, Oct. 22d, 1891.

are not extravasations of blood but are due to enormous dilatation of the capillaries in the neighborhood of tuberculosis patches. The capillaries are packed so full with red blood corpuscles as to give the appearance as though the blood current had come to a complete stand-still at this point. Only in exceptional cases did we find a rupture of the vessels and a hæmorrhage into the tissue. Like changes are found in the lungs, but they are not so marked or so constant. The small intestine is often strongly and evenly reddened. The symptom which never fails and which is really pathognomonic, is the hæmorrhage-like spots on the surface of the liver. They are best seen in animals with tuberculosis 4 or 5 weeks old, whose livers show numerous grey nodules which have not taken on that peculiar, well known yellow and brown marbleized appearance as a result of distributed necrosis. If one has seen the above described changes, a few times, there will scarcely be any doubt whether the tuberculin action is present or not.

My first experiments for isolating the active principles of tuberculin were made with alcohol.

If the tuberculin is mixed with five times its volume of absolute alcohol, a brown rosin-like mass is separated out which adheres tightly to the bottom of the vessel. The brown mass, as well as the fluid above it, which can be poured off clear, show on testing, about the same strength of action as tuberculin. Therefore, a separation in this manner cannot be brought about.

If alcohol in excess is added we obtain, in place of the rosin-like mass, a fine, granular precipitate, which, on repeated washing with absolute alcohol and collecting on a hard filter and then drying in a vacuum over sulphuric acid, produces an almost white powder. In order to obtain this precipitate it is advisable to proceed as follows: The tuberculin is slowly dropped in 20–25 times its volume of absolute alcohol under constant agitation. After the precipitate has settled, the alcohol is poured off and the same amount of fresh alcohol is added. This is to be repeated several times and then the precipitate is dried in the described manner above. If we try to dry the precipitate wet with alcohol, warming on a water-bath, it runs together and becomes brown, while in a vacuum exsiccator it dries to a white, spongy mass which can be easily crushed to a powder. Tuberculin yields about 10 per cent. of a dry powder on treatment with absolute alcohol. The latter, however, is by no means, the active principle in a pure state, for it contains besides a number of extractive substances not soluble in alcohol. It is not possible to precipitate all of the active principles out of the tuberculin with alcohol absolutus. For, if the filtered alcohol be evaporated, a clear, yellow fluid remains which consists of the glycerin and the substances dissolved in it. Half a gramme of this fluid is not enough to kill an animal, yet in one experiment death followed the injection of 1.0 gramme, and in another 1.5 grammes.

Even if all of the active principle cannot be obtained by precipitation with alcohol, still a number of inactive substances can be removed in this manner and above all the glycerine, which has a great influence on the solubility of the substances contained in tuberculin.

It was necessary to bring about a separation of the mixture of substances in the alcoholic precipitate. With the help of Mr. Proskauer and Prof. Brieger, pretty much all of the methods in question were tried for this purpose. Of these I will only specially mention the following: Treatment with ammonium sulph., magnesium sulph., calcium carb., baryt., phosphomolyb. acid., phosphotungst. acid., ferrum acetat., plumb. acetat., tannin, animal charcoal. But none of these methods were successful. Either the active principle was contaminated with too many other substances, as in the case of ammonium sulph., or it lost the action altogether, or it could not be separated from the precipitating substance in an active form. For instance, with tannin all of the active principles could be precipitated and the precipitate, brought into solution through addition of sodium carb., still possessed all of its effectiveness, but we were not able to separate the active substance from the tannin. Perhaps, in spite of these obstacles, these experiments, if continued far enough, would have led to results, had we not succeeded in nearly accomplishing our end in another way, whereby the former methods were pushed into the background for the time being. I observed that, if the alcohol was mixed with tuberculin in a very much less proportion than in the former experiments, *i. e.* in proportion of about 2:3, the rosin-like mass was not separated, but that a white flocculent precipitate formed which readily subsided and, by washings with alcohol of equal concentration, could be easily purified [reinigen]. In these experiments a part of tuberculin (e.g. 10 c.c.) is poured into a beaker glass and under agitation 1½ times

of volume, or 15 c.c. of alcohol is added; the glass is covered and allowed to stand 24 hours. By this time a flocculent sediment forms on the bottom of the glass in the dark brown fluid. The supernatant liquid is carefully poured off and an equal volume of 60 per cent. alcohol is added; it is again stirred up and then allowed to settle. This is repeated (about 3 or 4 times) until the alcohol above the sediment is almost colorless when it is washed several times in absolute alcohol in the same way (generally three times is enough), the sediment is placed on a filter and dried and then put into a vacuum exsiccator where it is freed of all moisture. It then produces a snow-white mass which, after drying at 100° C. (whereby it loses 79 per cent. of water) has, in the powdered state, a light grey color. Small quantities of the precipitate may be freed of its alcohol on a water bath, without its appearance being changed, as was the case with the impure precipitate obtained with 100 per cent. alcohol.

This precipitate formed with 60 per cent. alcohol surpasses all substances produced in other ways from tuberculin so much in efficacy and is so constant in all the reactions made with it up to the present, that we can look upon it as nearly pure; perhaps it is in reality the perfectly isolated active principles of tuberculin. While at least 50 mg. of the precipitate obtained with 100 per cent. alcohol is required to produce the same effect as 0.5 gramme of tuberculin, 10 mg. of the precipitate formed with 60 per cent. alcohol is sufficient; in several experiments the animals died after injection of 5 mg. from marked tuberculin action, indeed in one case death ensued after 2 mg. The yield is about 1 per cent.† If we compare the effect of the amount yielded with the effect of the amount of tuberculin used we find that scarcely one-half of the active principle has been precipitated from the tuberculin with 60 per cent. alcohol, and this agrees with the examination of the filtrate which, after freeing it of alcohol and adding water to the original volume, produces death of tuberculous animals in doses of from 0.75 to 1.0 gramme.

The 60 per cent. precipitate, which has been termed pure tuberculin, has the following properties:

† The yield may be increased by adding more alcohol to the tuberculin, e.g. 65–70 per cent. Then not only large quantities of the active principle are precipitated but also other matters are thrown down and an impure product is the result.

It dissolves in water easily, easiest when rubbed in a mortar with water. This kind of solution does not retain its efficacy very long, for it has been repeatedly observed that after standing one or two weeks it had lost considerable in action. Evaporation seems to affect the watery solution considerably, but it suffers less at the beginning, if sufficient fluid is still present, than towards the end of evaporation when it becomes quite concentrated; then coagula-like flakes separate from it, which do not dissolve on addition of water. A specimen of the precipitate which had been repeatedly dissolved and evaporated to dryness on a water-bath had finally lost its action altogether. After protracted standing and drying at a high temperature, purified tuberculin becomes partially insoluble. At first, I assumed that the insoluble constituents were foreign substances mixed with the tuberculin which could be separated by cautious heating with dry heat, hot steam, etc. Even after it was proven that the insoluble substances (if they had not been altered by repeated heating) had the same action as tuberculin itself, it was still probable that they were coagulated albuminous bodies which had taken part of the active principle with them during precipitation. As we were not able to separate the active principle either by the addition of other albuminous substances, which had been added to the watery solution of tuberculin and then coagulated, nor by the addition of other precipitable substances, this view had to be abandoned. Since the questionable substance has the same action as tuberculin, I am inclined to consider it as a modification of tuberculin, insoluble in water.

If the pure tuberculin is not very carefully produced and preserved it always contains a small quantity of this insoluble substance, and we do not receive a clear fluid by dissolving it. The addition of a small quantity of sodium carb. until distinct alkalinity is generally sufficient to cause everything to dissolve.

Solutions of pure tuberculin in 50 per cent. glycerin are, on the other hand, quite permanent. A solution which I have had for four months has remained unchanged in its efficacy. If the solutions contain a small per cent. of glycerin they may be repeatedly evaporated and dissolved without detriment, and when they contain a large amount they will bear very high temperatures. Several experiments were made in which it was exposed to a temperature of 130° C. and 160° C. for hours without observable diminu-

tion in its activity occurring.‡ Glycerin, therefore plays an important role in the preservation of tuberculin.

If we carefully prepare a concentrated solution of tuberculin and pour a few c. c. of it into absolute alcohol, a precipitate does not appear as soon as we should expect, but a very weak opalescence takes place. The alcohol may now stand for weeks without changing its appearance or without a precipitate forming. Purified tuberculin is, therefore, not altogether insoluble. 80 per cent. alcohol will take up considerable quantities and 60 per cent. alcohol will take up large quantities. Now, how does it come that tuberculin may be precipitated from the crude fluid by alcohol? This problem is very easily solved in that the alcohol containing the tuberculin had received all the constituents of the crude fluid. The addition of glycerin permitted no precipitation. The extractive substances formed a precipitate, but after these had settled, the alcohol still retained its opalescent appearance. Only after the addition of salts did the tuberculin form flakes and separate completely as a precipitate. Of the salts sodium chloride proved to be the best precipitant for tuberculin in alcohol. One drop of a concentrated solution of sodium chloride is sufficient to precipitate the tuberculin in several hundred c.c. of alcohol. This relation of tuberculin to dilute alcohol is to be considered in its purification. As soon as the mineral salts which favor the precipitation of tuberculin are removed by washing with 60 per cent. alcohol the latter begins to become opalescent *i.e.*, it begins to dissolve the tuberculin, and in this way large quantities are lost. If this takes place, the alcohol must be cleared by the addition of sodium chloride and for further washing absolute alcohol employed.

Of the chemical reactions which characterize tuberculin, the following may be mentioned:

First, it produces all albuminous reactions, the biuret reaction, Adamkiewicz's reaction (glacial acetic acid and concentrated sulphuric acid), with Millon's reaction a white precipitate forms which becomes reddish on warming, etc. Phosphotungsten. acid, acetate of iron, ammonium sulph., and tannic acid completely precipitate tuberculin out of its solution; also plumb. acetate produces strong cloudiness but no complete precipitation. Glacial acetic acid also produces at first a strong cloudiness and even a slight precipitate in the watery solution of purified tuberculin, but these disappear on further addition. The substance precipitated by acetic acid showed neither more nor less efficacy than the pure tuberculin, and appears to be very much like the modification which is insoluble in water and may be identical with it. Aqueous picric acid causes a flocculent precipitate which chars upon heating but reappears on cooling. Dilute HCl, and H_2SO_4 produce no precipitate. These acids have the same action in the concentrated form. HNO_3 on the other hand produces a precipitate that increases on standing; by boiling it becomes yellow and on addition of caustic soda becomes brownish-red (xanthoproteic reaction).

Ash analyses and elementary analyses of purified tuberculin were made by Mr. Proskauer and Brieger and were as follows:

1. Ash analyses:

I. Ash from 0.4816 gramme of substance (dried at 100°c.) 0.0802 gramme=16.65 per cent. (Brieger).

II. Ash from 0.1410 gramme of substance (dried at 100°c) 0.0265 gramme=18.46 per cent. (Proskauer).

III. Ash from 0.1740 gramme of substance (dried in vacuum) 0.0350 gramme=20.46 per cent. (Proskauer).

The preparations I and II I made, each being obtained from 500 c.c. of crude tuberculin. Preparation III was made by Mr. Proskauer from 300 c.c. (washed 3 times in 60 per cent. alcohol, 4 times in 70 per cent. alcohol, 3 times each in 80 per cent. and 90 per cent. alcohol and 5 times with absolute alcohol, the latter displaced by ether and then dried). The ash consisted almost exclusively of potassium and magnesium phosphates and contained no chloride. The ash of sample II contained 59.84 per cent. of phosphoric acid.

2. Elementary analyses (calculated for substances free of ash):

	1. Brieger	2. Proskauer	3. Proskauer
Carbon.....	47.02%	48.13%	47.67%
Hydrogen.....	7.55%	7.07%	7.18%
Oxygen.....	14.45%	14.46%	14.73%
Sulphur.....	——	1.17%	1.14%

For the elementary analyses the same preparations were used as for the ash analyses.

‡Prof. Pfuhl made several experiments at the same time: 1—crude tuberculin, 2—watery solution of tuberculin, 3—50 per cent. glycerin solution of purified tuberculin were exposed to a temperature of 160° C. for 2 hours and then corresponding quantities of each injected into tuberculous animals. The animal which had received the watery solution alone remained alive; both the others injected with the crude and purified tuberculin respectively died, and showed pronounced tuberculin action.

If we take all of the described properties of purified tuberculin into consideration we must assume that it belongs to the group of albuminoids. The high ash contents and the irregular course of a few reactions (plumb. acetate and glacial acetic acid) lead us to believe that the substance had not been obtained wholly pure, but that other matters, though in small amount, may be present and consist perhaps of traces of albuminous and mineral bodies similar to tuberculin, which, as far as the therapeutic value of the preparation is concerned, have no significance. Although tuberculin appears to be closely allied to the albumins, still it is distinguished from these and especially from the so-called toxalbumines, through its behavior toward high temperatures. It also differs from the peptones in many particulars, namely through its preciptability with ferrum acetate.

It is not improbable, that by further research in the field of the products of pathogenic bacteria still other substances will be found which will permit of this classification into a special group of albuminous bodies.

In the chemical examination of tuberculin the trials of the purified substance in regard to its physiological action were confined to experiments upon tuberculous guinea pigs. After we had succeeded as far as possible in isolating the active substance, it was naturally of great interest to learn how it acted upon man, *i. e.*, if the desired therapeutic effects of crude tuberculin took place in the use of purified tuberculin with the absence of all disturbing extraneous action.

For this purpose experiments were first made on healthy subjects and, indeed, on physicians who kindly presented themselves for the trials.

Dr. Kitarate received on June 24th, 1891, at 12 m. an injection of 2 mg. At the time of injection the temperature was 36.5°. It rose at 8 p. m. to 38.3°, remained until 11 p. m. at 38.2 and then fell quite rapidly. At 4 p. m. coughing set in which lasted for 3 hours. Then followed headache, languor and sweating. Otherwise the general condition was undisturbed. (Pulse rose from 72 to 92).

Dr. A. Wassermann received on June 25th an injection of 3 mg. The temperature rose in the course of 11 hours from 37.2° to 38.7°, then fell to normal. At the beginning of the reaction tenderness and a sensation of drawing were observed in the breast and abdominal muscles; also heat and dulness in the head, no chill. (Pulse rose from 80 to 114).

Dr. H. Maass, July 13, 4 mg. Temperature rose in the course of 12 hours, from 37.0° to 39.0°. The subjective disturbances consisted of slight chill and later, fever, languor and headache. (Pulse rose from 72 to 100).

Director Dr. P. Guttmann, July 28th, 5 mg. Temperature rose from 36.5° to 39.2° within 8 hours. Four hours after the injection increasing drawing in of the limbs, after a further 2 hours' chill he was forced to take to bed. Then followed fever and sweating. No headache but vomiting of gastric mucus (for sake of precaution very little food was taken). Also complete sleeplessness. (Pulse went as high as 135).

In all of these cases the patients had either wholly or nearly recovered after 24 hours.

The temperature rise corresponds exactly to the amount used in each dose:

2 mg.	gave	38.2°	maximal	temperature
3 "	"	38.7°	"	"
4 "	"	39.0°	"	"
5 "	"	39.2°	"	"

But the subjective symptoms also kept equal pace with the temperature, and all the known disturbances occurring after injections of crude tuberculin again showed themselves, so that a difference between the purified and unpurified preparation in this respect could not be observed. This was especially the case in one example which differed from the cases just described and, therefore, deserves special mention:

Mr. O. Wassermann of strong physique and without demonstrable evidence of tuberculosis, received on July 27th, 4 mg. of the purified preparation. The temperature rose from 36.9° within 10 hours to 39.5° then fell to 38.4, again rose to 40.2° 27 hours after injection. During the first rise of temperature the subjective disturbances remained within medium boundaries, so that he could take a walk. Shortly before the second rise of temperature a chill occurred, the pulse reached 140, was small and irregular, so that excitants (alcoholics) appeared necessary. Pulse and temperature only returned to normal after the lapse of 48 hours.

If in this case a suspicion of tuberculosis, for which a few symptoms point, or the restless condition of Mr. Wassermann can give the explanation for the irregular and violent reaction, must remain undetermined. This observation, however, undoubtedly teaches that purified tuberculin can, through a too strong reaction, bring about grave symptoms.

With correspondingly small doses and in a cautious manner, we made extensive researches with purified tuberculin upon tuberculous patients in the Moabit Hospital,

who were treated for months partly with pure tuberculin alone and partly in alternation with crude tuberculin. In short, these experiments lead to the conclusion that there was no essential difference in action between the purified and crude tuberculin. The first has the same diagnostic and therapeutic value as the latter, if it is used in such doses that the reaction phenomena, *i. e.*, the temperature, which is the safest guide, reach the same height. While it was observed that the purified tuberculin was, for guinea pigs, 50 times as strong as the crude, for man it was found, at the highest estimate, to be only 40 times as strong.

As regards the dosage the purified tuberculin possesses no advantage. For its effect cannot be gauged on the ground of chemical reactions any more than that of the crude, but must be determined by experiment on the animal organism, and the dose of both remedies is, in every case, to be measured to correspond with the conditions at the bedside, which would not be altered if the action of the purified tuberculin was absolutely uniform.

If the purified tuberculin is any more stable than the crude or not, further experience alone can tell. Up to the present time, crude tuberculin has shown itself to be very permanent in a solution rich in glycerin. At least I have not been able to notice a diminution in the efficacy of the oldest specimens of tuberculin at my disposal.

Interesting and important as the efforts to produce the pure active principle may be from a theoretical point of view they have made no practical advance; but this shall not deter me from pursuing these questions still further.

THE METHOD OF PREPARING TUBERCULIN.

In my last publication upon tuberculin I gave enough as to its origin and preparation to enable a competent person to follow my methods. The announcement that tuberculin is contained in the tubercle bacillus cultures, and that the presence of the same can be demonstrated at all times by experiments on tuberculous guinea pigs, and that the experiments to obtain the active principle from the cultures can always be controlled by inoculation on animals, should have sufficed to enable a skilled bacteriologist to obtain tuberculin or a similar substance. If, in spite of this, only a few bacteriologists have approached the task and, as I am able to judge from the heterogeneous mass of literature, have only partially solved it, still a certain amount of shame rests on the bacteriologists of the day who, instead of independently investigating for themselves, boisterously clamor for a receipe for preparing tuberculin. It is questionable to me if the method which I employ is the best or not. In the course of time I have continually improved it and hold that it can still be improved, and hope that an altogether different and better method may be found. If now, when the judgment of the tuberculin question has become quieter and more objective, I deem the time ripe for the publication of my methods of preparation, I should very much regret it, should others slavishly adhere to my rules and not try to produce something better.

I would further remark that the difficult point in the preparation of tuberculin lies in understanding how to cultivate tubercle bacilli in large quantities. Without extensive cultures, the preparation of tuberculin in any quantity is altogether out of the question. Skilled bacteriologists alone can cultivate tubercle bacilli in large quantity; the unskilled will also be able to produce large, but not pure cultures; with impure cultures he can only do mischief and he had, therefore, better keep his hands off.

Originally, I cultivated the tubercle bacillus on glycerin peptone-agar in test-tubes; after the cultures had reached full development, I washed them off, gathered them on a fine wire sieve, poured a 4 per cent. glycerin solution over them, evaporated to $\frac{1}{10}$ of the mass with this solution, filtered off and thus used the filtrate. The cultivation on agar in test-tubes is very tedious and the yield is comparatively small. As it was necessary to have large quantities, larger vessels had to be used for the cultures. Here there was difficulty in using the nutrient agar, and I went back to old experiments which I had made in cultivating the tubercle bacillus in a fluid nutrient medium. In the beginning the cultivation was not very satisfactory; they grew very slowly and poorly in the liquid. By chance I observed that certain flat pieces of the culture, which remained dry on the upper surface, floated on the surface of the liquid and developed in a most luxuriant manner. They formed in the course of a few weeks a pretty thick skin, above dry, and often folded, of a whitish color, which completely covered the surface of the liquid. After 6 to 8 weeks the growth is at an end; the skin then begins to imbibe the fluid and, finally, falls to the bottom in

ragged flakes. The yield of such a culture is much greater than that obtained upon a solid nutrient medium.

As a culture fluid, an infusion of veal, prepared in the ordinary way, can be used. It must be of a weak alkaline reaction and have the addition of one per cent. pepton and 4 to 5 per cent. of glycerin. Instead of the veal infusion, a one per cent. meat extract solution can also be used.

A bulb-glass with a flat bottom is the best culture vessel. They should be half filled, say with from 30 to 50 c.c. of the fluid and well sterilized, and then so inoculated that not too small pieces of the seed culture float upon the surface of the liquid. The cultures are best kept at 38° C.

In regard to the origin of the tubercle bacilli used in the cultures I have found no difference. It is immaterial as to the efficacy of the tuberculin whether the bacilli are taken from first cultures or from those several years old; likewise whether the cultures are derived directly from tuberculous persons or from those which have been several times passed through the animal body.

In this method of cultivation, part of the active principle goes into the nutrient fluid, which can be easily proven by injecting it into tuberculous guinea pigs. Therefore, after I had noticed this I no longer used a watery solution of glycerin, but extracted the nutrient medium with the tubercle cultures in order to also obtain in this way the active principle contained in it. That the cultures have been sufficiently extracted is proven by the fact that they are only capable of producing a very slight effect on tubercular guinea pigs and that the culture fluid, when evaporated without the cultures, produces a very much weakened tuberculin.

The cultures used for this extraction must be perfectly ripe, *i. e.*, 6 or 8 weeks old. They must, as a matter of course, be absolutely pure, of which we must convince ourselves by microscopic examination of each vessel. Only after long practice will we be in a position to judge of the absence of contamination through foreign micro-organisms without this examination, which as is well known, is far more difficult in a fluid than in a solid medium.

The cultures that have been found to be perfectly pure are to be evaporated to $\frac{1}{10}$ of their original volume, in a suitable vessel, on a water-bath. Since they are hereby exposed to a temperature of nearly 100° C. for hours, we may assume that the tubercle bacilli in the thickened fluid are killed without exception. In order to remove these bacilli as far as possible the fluid is filtered through a clay or gravel filter.

The tuberculin thus obtained contains about 40 to 50 per cent. of glycerin and is thereby protected from decomposition by other bacteria. We have only to be careful that it is not contaminated by moulds. Thus preserved, according to all appearances, it retains its efficacy for a long time, perhaps for years.

Before it is used, its strength, as a matter of course, must be tested. This is done by injecting diminishing doses in tuberculous guinea pigs. If for testing each dose we take at least two animals and the difference between the doses diminishes sufficiently, the strength of the tuberculin may be tested with ample accuracy. In selecting the animals for the test it is, however, necessary that they be, as far as possible, in the same stage of tuberculosis.

INTERESTING CASES OF ABDOMINAL TUMORS.*

BY JOSEPH M. PRICE, M. D.,
PHILADELPHIA.

Mrs. R. [Dr. Keller's patient], suffering from sarcoma of the left ovary. She has complained only for the last nine months, has rapidly lost flesh, and continuously enlarged from encysted peritoneal dropsy.

She gave a history of a tumor and spoke of it as dropping from the right side to the left. The appearance of her face was that of one suffering from ovarian disease. There was in her diseased condition indications of more serious complications.

June 14th we operated for the removal of the diseased condition, and found encysted dropsy and sarcoma of the left ovary as large as a child's head, and as the hæmorrhage was so great from a slight examination, it was thought best to remove it, and it was done in as perfect manner as possible. The ligature of the pedicle controlled the hæmorrhage perfectly; thorough washing of the peritoneal cavity; a drainage tube at the lowest point from which the tumor was taken; careful closure with simple dry dressings completed the operation. The tube was left in four days; the patient made a rapid recovery from the operation.

*Read before the Philadelphia County Medical Society, October 28th, 1891.

I expect this poor woman to have her disease return, and that very soon, and could I have been perfectly sure of what the trouble was, I would not have operated. But when we do undertake anything for their relief, let us at least leave them in as good condition as we found them, and not with dangerous hæmorrhage to destroy them in an hour or so, and all because we have not the courage to complete an operation we had the assurance to begin.

Present: Drs. Jos. Price, Morris, Murry, and Keller.

This patient was examined on the 26th day of October; she is perfectly well and doing her work, with no indication of a return.

Mrs. J. T. [Patient of Dr. Hutzell]; this young woman, twenty-one years old, has been suffering for eight years from a complication of diseases which culminated in an operation for her relief. At fifteen years of age she had a discharge from the navel of pus and hard calcareous matter; this discharge lasted some two years; she had not enjoyed a single day of perfect health for the last seven years, but had for the most part done her housework and assisted her husband in his laborious business for the last year, with a condition of things in her pelvis that is hard to imagine anyone walking about with, much less work. She only submitted to an operation because Dr. Hutzell told her nothing else would help her to get well. Examination of the pelvis indicated pus and a general adherent condition of all the pelvic contents, so that I did not expect an easy removal of the diseased condition, but I was not prepared for such an uphill undertaking as I found was necessary for the relief of this most distressing case.

After the usual opening of an inch and a half, I found the pelvis blocked with a peritoneal cyst with dark and bloody contents; this was emptied and the contents of the pelvis at once investigated. Both tubes were diseased; the left with a more than a pint of offensive pus, the right two or three ounces of pus, both adherent to all the surrounding viscera. The enucleation was most difficult from start to finish. In addition to the pelvic disease and the peritoneal cyst, there was a collection of large, hard concretions, some of them as large as a walnut, completely covered by folds of the bowels and the peritoneum.

In the removal of these concretions there was an additional risk to the patient, they had to be removed from their bed. The bowel folded around them so that it was difficult to tell where to begin without opening the bowel. The effort for their removal consumed considerable time, but all were removed that could be found. Perfect irrigation of the entire abdominal cavity after most of the adherent bowels were torn apart. I say most of them, for it was impossible to complete the separation; they were so well formed that I considered it unsafe to do so much tearing in this complicated condition of affairs. Thorough washing, with the drainage tube in the most depressed portion of the pelvic cavity, a complete toilet, and the patient put to bed. Time of operation, forty-five minutes.

She was by all odds the best patient I had the pleasure of treating. She made a perfect recovery after one week of drainage, with not a single complaint from beginning to end.

Examined on the 26th of October; perfectly well; no pain; able to do all of her work with perfect comfort.

Miss W. R., aged forty years, suffering from a rapidly growing hard tumor filling the pelvis. The cervix high to the right and above the brim of the pelvis and a hard body the size and shape of the uterus. The tumor movable all but the pelvic portion, which was apparently fixed. The patient was only aware of a lump in the side during the last two or three weeks prior to operation; she was sure it was not there a month. When I examined her the day before the operation, the tumor was as large as a womb at the seventh or eighth month of pregnancy, and nodular. She was incapacitated for work, and it was decided to remove it as its rapid growth indicated malignancy.

July 9th, with the assistance of Drs. Jos. Price and Morris, I removed the entire uterus and appendages, and left nothing but the cervix clamped by the Delta metal wire nœud, with dry iodoform dressings to finish the operation.

The tumor was a most interesting one, and in a great measure explains the history the woman gives of its rapid growth. In the pelvis there were three fibroids with all the pathological characteristics of tumors of that nature; the cervix to the right and high up, and the uterine canal not over three inches long, enclosed by the large tumor to the right of the uterus, and front and back of it one of the little fibroids.

The large tumor was entirely different in all of its pathological appearances, and when opened had a distinct capsule, and when the capsule was opened widely gaped, as if there

were great pressure from within pushing out the muscular tumor, or I have no doubt a malignant and rapidly growing tumor inside the capsule.

Tumor examined by Dr. Bigelow: spindle-cell sarcoma.

Patient examined October 28th: at work, free from pain and in good health.

Miss M. D., aged thirty-two years, suffering from left ovarian tumor with myxo-sarcomatous contents. This young woman was accused of being pregnant by several well-known doctors who had treated her for several months. Patient submitted to an operation to remove the suspicion of her unchastity. Operation was an easy one and she made an uninterrupted recovery. Weight of tumor, twelve pounds, with contents.

Mrs. M., aged forty-five years, was taken on the 13th day of Sept. with slight pain in the right side of the abdomen; on examination it was thought the area of dulness over the liver was considerably enlarged; had no increase of temperature or pulse. An effort was made to move the bowels, which was persisted in until the 17th. During this time ten calomel powders were given, four Seidlitz powders, two bottles of citrate of magnesia in divided doses, two ounces of Epsom salts, one drop of croton oil. There was no vomiting and no increase of pulse or temperature. The patient's condition was up to this time good, but a very anxious expression of the face was beginning to appear, and she wished something done for her relief.

Pulse beginning to show signs of weakening; no tympanites. At this time we thought something radical must be done to relieve the obstruction of the bowel. Gall-stone was not suspected. Ether was given. An opening directly over the region of dulness, two inches in length, was made, when a great distended gall-bladder was at once discovered, tapped, and the contents drawn off, which was a clear, gelatinous fluid; had none of the characteristic appearances of bile. The gall-bladder was examined, and two large and one small stones removed.

The direct cause of the obstruction of the bowel was the pressure made by the distended gall-bladder with the gall-stones laying on the transverse colon. This pressure was made possible by the distension of the gall-bladder as it enlarged and was pressed backward by the abdominal wall, making pressure on the colon, and causing the obstruction, which was as complete as any I have ever seen.

Drainage-tube placed in gall-bladder, which was securely stitched in upper angle of wound; two sponges had been placed in the peritoneal cavity to protect it from the discharges; these were removed and thorough irrigation of the abdomen was made. Silkworm-gut sutures; closure of the wound; dry dressings and bandage. The effort to move the bowels was continued until the third day after the operation, when a slight movement was obtained; flatus passed freely. On the fourth day there were free purgations after large and repeated doses of Epsom salts, both by the mouth and injection. Injections were also used freely before the operation, as well as all the other treatments. Calomel powders every twenty minutes; one dozen or more given. Patient made a most beautiful recovery and is now able to attend to her home as before.

Mr. G. C., aged forty-six years (Dr. Prendergast's patient), had been suffering for a long time, when making unusual exertion, with pain in the region of the head of the colon. Four days before operation, while at Atlantic City, was taken with very severe pain in the abdomen; on his arrival at home his physician gave him small doses of mild chloride and soda, followed by Rochelle salts. He was freely purged and all the urgent symptoms relieved, but he still complained of pain at the head of the colon. After a careful examination, Dr. Prendergast decided that his patient was suffering from appendicitis or abscess at head of colon. Patient had quick pulse, subnormal temperature, distended abdomen, anxious countenance, and was a very sick man. At this time I was called in consultation, it being the evening of the fourth day of his disease. An operation was advised and consented to by the patient.

August 29th, at 8 A. M., ether was given. An opening one and a half inches inside of the crest of the ilium directly over the area of dulness down to the abscess cavity, was made, and from four to six ounces of pus and fæces were discharged. The appendix was folded back, and to the outside of the colon, almost entirely separated from it by ulceration. The parts seemed to be so soft and gangrenous in appearance, that I thought it best to leave everything in position, use irrigation, two rubber drainage-tubes, and pack with gauze; but when I washed out the cavity I found that the slight barrier that had separated the abscess from the peritoneum had been broken, the intestines protruding through the wound. I at once decided to wash out the peritoneal cavity and use glass drainage into the pelvis, and dress

the external wound as above stated. Three stitches were applied, but two were cut away that evening. Patient was freely purged the night before the operation, and began purging on second day, and continued naturally, four or five movements per day, until the fourth day; after that salines were given to keep the bowels free.

Patient made a beautiful recovery. For this result I am greatly indebted to his physician for his untiring care and attention and good treatment before, during, and after operation.

Mrs. J. W. H. [patient of Dr. C. H. Dunham, of Trenton, N. J.], suffering from extra-uterine pregnancy. Operation, Oct. 14, 1891. Recovery.

August 1st, was taken with very severe pain on left side, accompanied with diarrhœa; she was four days over her expected period; while at stool felt severe pain in lower left side of abdomen, and immediately became sick at the stomach and faint. Her period made its appearance at this time and continued for three weeks. This is her statement of her condition. She was attended for nine weeks by a practitioner unknown to me, and had frequent recurrences of her first attack. When Dr. Dunham was called to her assistance, she was having daily chills with other symptoms of peritonitis, also a tumor filling the abdomen as high as the umbilicus. At this time Dr. Dunham telegraphed me he had a case of extra-uterine pregnancy, and asked me to come prepared to operate. I went to his assistance October 14th, and found the patient in bed, perfectly comfortable, without any indication of trouble, owing to free purgation which the doctor had given her preparatory to operation. The increase of pulse and the tumor remained as proof of the correctness of the diagnosis.

A small incision was made in a thickened and much changed peritoneum, immediately on the opening of which great quantities of very offensive blood was discharged from the abdomen. Instant search for the impregnated tube was made, brought up, and ligated. Thorough irrigation and drainage; the latter was continued for four days. Great, broad flakes of inflammatory lymph were removed from this cavity. At the time of operation there was a distinct inflammatory diaphragm extending from crest of ilium to crest of ilium, leaving a large cavity lined with this product, which would not permit the internal viscera to return to their place; this cavity was filled with boiled water. Not a single bad symptom an uninterrupted recovery.

Married two years; no children.

Mrs. A. G. B. [patient of Dr. C. H. Dunham, of Trenton, N. J.; his second case of extra-uterine pregnancy in five days,] suffering from extra-uterine pregnancy. Operation, Oct. 19, 1891. Death.

Patient is thirty-six years old; has three children; eight years between first and twins twenty months old. She passed one period August 8th, and September 6th had a slight discharge, pale in color. One week later she had severe hæmorrhage with pain and symptoms of miscarriage; persistent diarrhœa with sick stomach; felt weak and faint. A rupture at this time had unquestionably taken place; hæmorrhage continued with recurring attacks of pain. The doctor had made his diagnosis early in the case, but free purgation had so relieved her that he was persuaded to delay; but her condition continuing to grow worse—pulse 130, temperature normal, patient very pale, a decided boggy feeling in the pelvis, and hardened masses in the abdomen—decided him to have an operation, and he asked me to see her and operate at once. Through a small incision I opened the peritoneum. The abdomen was full of fluid and clotted blood to the diaphragm; no odor; no indications of peritonitis. I immediately removed the impregnated tube, which was on the right side. The fœtus was also found by Dr. Dean, of Spartanburg, S. C., who was assisting us. The blood-clot was adherent to every portion of the peritoneum, and to the anterior and posterior face of the omentum. It could not be removed by flushing or scraping. A large conical clot, as large as my two fists, extended down by the rectum. All the clots and free blood that could be washed out, using three large pitchers of water, were gotten rid of. After free irrigation the peritoneum has anything but a comfortable appearance, as it was perfectly black from adherent blood-clot. There was no odor to the blood, no apparent chemical change having taken place. As to the purging in these cases, I have no doubt it is from the pressure of the clot on the rectum. The absorption of most of the fluids and saline constituents of the blood may have some effect to increase the diarrhœa. The tenesmus and straining at stool unquestionably increases the loss of blood, greatly increasing the danger of the patient.

A seven inch drainage-tube was left at the lowest point of the enucleation, and the

top of the tube just reached the abdominal wall. Boiled Trenton water was used for irrigation, and about one quart was left in the peritoneal cavity. Twenty-four hours after operation the pulse was 120, and temperature 101½°. Heart-clot feared, otherwise patient doing well.

Death from heart failure three days after operation; patient was too comfortable to do well from the beginning.—For discussion, see Society Reports.

WHOOPING-COUGH AND ITS TREATMENT.

BY JOHN M. CURRIER, M. D.,
NEWPORT, VERMONT.

Whooping-cough I regard as a disease depending upon a specific micro-organism. That organism is introduced into the system through the air passages, by inhalation. On the mucous membranes of the air passages the organisms develop, producing succeeding generations and furnishing contagion in the expired air to other persons. The membranes of the air passages become irritated and inflamed by the development thereon. The persistent, periodical cough is the act to get rid of the foreign substance. The characteristic whoop is a nervous phenomenon resulting from the prolonged, unavoidable coughing, which develops only several days after the patients have been coughing.

The indications for treatment are: 1. To destroy the organisms in their homes, rendering them inert, and sterile; 2. To render the mucous membrane of the air passages as little susceptible to the irritation of the organism as possible. The old methods of treatment I have found useless or worse than useless. I have hit upon a form of treatment which has thus far proved satisfactory and seems sufficient to not only mitigate but cut short the disease. The following powder I use by insufflation four or five times a day in mild cases, and oftener in severe ones. It is better to use it in advance of a paroxysm than subsequently. If its use is delayed too long until the effect of the anodyne has passed off it will seemingly produce or hasten the paroxysm.

℞

Hydrar. chlorid. corros.	gr. j.
Pilocarpinæ	grs. x.
Cocainæ Hydrochlorat.	grs. xv.
Ammonii Chlorid.	ʒ iijss.

M. These should be reduced to an extremely fine powder.

THE REMOVAL OF THE CRYSTALLINE LENS IN HIGH DEGREES OF MYOPIA.

BY ARTHUR D. MANSFIELD, M. D.,
ASSISTANT SURGEON AT THE PRESBYTERIAN EYE, EAR AND THROAT CHARITY HOSPITAL OF BALTIMORE.

It is not a new idea, it is not an original idea, but it is a novel idea as well as an old one.

Remove the lens in a healthy eye? Produce cataract and its risks that we may obtain benefit? Shall we convert a myope into a hyperope? That is exactly the question.

What shall be done for an eye that is progressing, as is seen in all cases of high degrees of myopia? Shall we allow it to progress and be unable to stay its course? By no means—I think the proper thing to do when the indications are clear, is to remove the lens and stay the progression of the refractive error and check the anatomical changes in the eye which is bound to affect it more or less permanently.

The originator of this ingenious device by means of which a dangerous myopic eye can be changed into a comparatively harmless hyperopic eye I do not know, but Dr. Fukala, of Pilsen-Karlsbad has within the past few years, experimented on some 19 cases, which he recites in the *American Journal of Ophthalmology*, Nov. 1890, a translation by Casey Wood, of Chicago, from Graef's *Archiv. für Ophthalmologie*, xxxvi. In these cases he clearly demonstrates that good results have been obtained in many cases, the improvement ranging in many from four fold to twelve fold, with a medium or average improvement of seven fold.

We are all well aware that myopia is necessarily a progressive trouble of the eye and that the more the eyes are used the faster and more rapid is the increase of the error. In examining myopic eyes we find the fundus in most cases very characteristic, usually a thinning of the choroid and this thinning may be so great as to cause the diagnostic rupture at the nerve entrance, viz: the myopic crescent. Again we may find patches of choroiditis and even choroidal atrophy in the fundus, along with the myopia; when this is the case operative measures are contra-indicated.

I shall confine my remarks in this brief article more to a resumé of the important

suggestion than to the advancement of any new or original ideas. That the subject is an important one cannot be doubted for an instant by any ophthalmologist and even the general practitioner can see the value of such a procedure when done under proper circumstances and advantageous conditions of the fundus of the eye, both of which I will endeavor to point out to you. Ophthalmologists are ever striving to perfect a science that already is as near perfection as can well be expected when compared with others of our general science of medicine. We have few disorders that we have doubt about as to cure, not that I mean to infer that all eye troubles are curable, but when curable it is as positively known, and when incurable a like and similar knowledge is possessed.

Ideas may be suggested and meet with little or no notice, may lie dormant for years and then noticed by some one, brought forward, and prove a boon and benefit to mankind; the science of medicine is full of such ideas and this one, the topic of my article, is an instance, suggested years ago, was little thought of and lately revived and tried by Dr. Fukala, of Pilsen-Karlsbad, may prove one day a blessing to a small portion of mankind. To take up the subject: First, when should the lens be removed? Second, how should it be removed? Third, what are the benefits that will follow?

Taking up the first question as to when the lens should be removed, I may state that the indications briefly given and summarized from the lengthy article of Dr. Fukala in the "*Journal*" are as follows: The degree of myopia must be above 13 dioptres, that they should be young adult persons not over 25 or 30 years old, and able to read No. 1 of Targer's test types as their punctum remotum, that further on examination of the fundus of such an eye the retina choroid and nerve should be healthy and free from all inflammation or results of inflammatory processes.

How should the lens be removed? Dr. Fulkala recommends in all cases an iridectomy upwards, lessening thus the danger from intra-ocular tension consequent upon the discission of the lens, the iridectomy also preventing any occurrence of iritis or chorioiditis. The lens should be removed by discission and not by extraction—secondary cataract should always be guarded against. The only objection to the iridectomy is the disfigurement, but the presence of the coloboma as a disfigurement is infinitely outweighed as a precautionary measure. The advantages resulting from the aphakia are summed up briefly:

1. Distinct vision for the eye is obtained.
2. Retinal images are very much enlarged which in itself is a marked advance and benefit.
3. Visual acuity is improved.
4. When using the eyes normally for the distance the myope uses his accommodation, thus the relaxation of the accommodation is marked and complete in many cases, the accommodation being impaired, which latter condition cannot be called strictly an improvement, yet it is an advantage when compared with the previous condition present in the eye prior to the operation.
5. Often in high degrees of myopia the binocular vision is at fault, especially when the degree of myopia in the two eyes is far apart as to quantity and degree, binocular vision for near work is restored by this removal of the lens.
6. The work at the punctum proximum is held at proper distance from the eyes and not at the myopic distance which varies with the degree of refractive error.
7. Spasms of the accommodation and all disturbing elements disappear in this method of treatment; this is of a necessity so, as the accommodation is greatly impaired.
8. The myope is converted into an hyperope which is not progressive and ceases to be a form of annoyance as soon as the eyes are properly adjusted with glasses.

The subject is an important one, I take it, and hope it will call forth the expression of views from any who may have had experience with the subject as presented.

129 S. Broadway, Baltimore, Md.

Society Reports.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

Stated Meeting, October 28, 1891.

Dr. M. Price read a paper on Interesting Cases of Abdominal Tumor (see page 930.)

DISCUSSION.

Dr. B. F. Baer: I have been much instructed and interested in this report of the cases of Dr. Price, and I was especially interested in the case of sarcoma. I have had five cases of fibro-sarcoma, and in none of these cases has the disease returned. One

was operated on two years ago, another a year and a half ago, and the others at a more recent period. These were solid tumors. One weighed fifteen pounds, another nearly that, and a third five pounds. They were surrounded by peritoneum, but there were no papillary growths. I would infer from the report that in the case of Dr. Price the tumor was breaking down and papillomatous.

I have recently had a rather rich experience in regard to difficulties in the diagnosis of pregnancy. The most difficult operations that I have done in the last two years have been done in the past two months, in neglected cases diagnosed as pregnancy. One was a case of poly-cyst of the ovary in which the physician was so certain of his diagnosis that the pains of which the patient complained were regarded as labor-pains, and on two occasions the bed was made up for the accouchment. When the patient was *in extremis* it was decided that she was not pregnant. In this case the adhesions were frightful, and the operation was very difficult.

The second case was operated on a week ago, and the tumor weighed about sixty pounds. The patient was thought to be illegitimately pregnant, and was sent to this city two months ago, to be confined away from home. She went down hill very rapidly. Two or three of her physicians thought that she was pregnant, but in this instance, as well as the first, the mistake was due largely to carelessness. They took it for granted that she was pregnant, and did not examine carefully. She was the weakest patient on whom I ever operated. There were firm adhesions to the liver, and I think a piece of the liver was torn off. The adhesions were universal, and the tumor was removed with difficulty. So far the patient is doing well.

Dr. John C. Da Costa: I might speak of one recent case of interest in the matter of diagnosis. The patient was a woman forty-six years of age, who presented the symptoms of fibro-cystic tumor of the uterus. The only point against this view was the comparatively rapid growth of the tumor. There were two or three able men with me at the time of the operation. I found two tumors. The first one was enucleated, and seemed to be a true fibroid. The second looked like a fibro-cystic growth, but when it was cut open it was found to be a fibro-sarcoma. Hysterectomy was then done, and the uterus was found to be filled with sarcomatous tissue, although there had been no evidence of uterine sarcoma. Here we had three different conditions, two malignant and one non-malignant, but capable of change—sarcoma of the uterus, fibro sarcoma, and fibroid.

Dr. Joseph Hoffman: A point brought out by Dr. Da Costa's remarks is that a deferred operation is a dangerous one, because in all of these growths, especially those of a fibroid nature, degeneration is apt to go into something malignant. Sarcoma may take any form known to pathologists. Delay is, therefore, dangerous, and the idea of melting out tumors which are already practically on the road to malignancy by any means except radical removal is foolish, and not supported by the clinical facts. I know of one case of mistaken diagnosis of pregnancy for ovarian tumor, by which, after a very minute examination, the woman was put in the Episcopal Hospital, and allowed to remain three or four months in order to confirm the diagnosis, although the diagnosis had been made. Where the uterus can be felt outside of a fibro-cystic tumor, I do not see how a mistake can be made. In obscure cases it is better to see what we are about by an exploratory operation, than to make a diagnosis and hold on to it until time shows that we are wrong.

Dr. William E. Ashton: The danger of fibroids undergoing malignant change is an argument in favor of their early removal. In the majority of cases, however, it is impossible to urge early operation on account of the past education of physicians. We have been taught that fibroid tumors are of an innocent nature, and that when the woman reaches the menopause they will undergo certain changes which will result in the patient's recovery. I find, however, that the vast majority are not affected by the change of life. I think that in most cases in which oöphorectomy has been done in the hope of bringing about an early menopause, the results have been unsatisfactory. Another point is that a large number of these cases have diseased appendages. Many of these cases suffer pain, and this has been ascribed to pressure, but I think that this pain is due in many instances to localized attacks of peritonitis due to the diseased condition of the appendages. Taking into consideration the fact that there is danger that the growth will become malignant, and the fact that the appendages are usually diseased I think that it is the duty of the profession to educate the coming physician in regard to the necessity of the early removal of the fibroids.

Dr. Price, in his case of appendicitis, refers to the adhesions being frail, and not

trusting them. I think that if there is any doubt as to the pus being excluded from the peritoneal cavity, we should not hesitate to flush the abdominal cavity and drain. In a case on which I operated some time ago, and in which the head of the colon was ulcerated through, I had the same difficulty. I got into the abdominal cavity and found pus. With thorough irrigation and drainage there was complete recovery.

DR. ERNEST LAPLACE: I was interested in the apparent triple nature of the growth in Dr. Da Costa's case. A word or two will explain this. The growths started as fibroid tumors. The life of this fibroid tissue may be longer or shorter. As soon as it dies it disintegrates and softens. The apparently triple nature of the lesion was due to the growths being of different ages. The growth that had retained its integrity was the youngest, and the others were older and had undergone degeneration.

DR. FRANK WOODBURY.—In connection with the remarks just made in favor of operative treatment in uterine fibroids I might refer to one patient whose history shows that circumstances alter cases, and that it is difficult to lay down any general rule that will cover every individual instance. This particular patient has been under my observation nearly twenty years. In 1874 I was called to see a colored woman, about twenty-four years of age, who had almost continuous menorrhagia. She suffered with pain, obstruction of the bowels, and difficult micturition. Examination showed a hard cervix with the uterus enlarged and firmly adherent, occupying nearly the whole upper part of the pelvis. I treated her on common-sense principles, inserting Barnes' rubber air-bags back of the uterus, inflating them twice a day until I had stretched the adhesions, and lifted the uterus out of the canal into the abdominal cavity. She became much more comfortable, and for a year continued the use of ergot and chloride of ammonium alternately. After freeing the uterus I introduced a rubber ring pessary inflated with air. She became greatly improved and passed from under my observation for some two years, when she returned with leucorrhœa. I found that the pessary had ruptured, and was almost imbedded in the vaginal tissue. I removed the remains of the pessary, and found a cicatricial ring forming a support for the uterus. The patient again disappeared, and was not seen until a year and a half ago, when she sent for me. She was then suffering with an acute attack of pain in the abdomen—probably something analogous to the pleuritic stitches which occur in old cases of pleurisy. An able physician had seen her and decided that she was pregnant and in labor. The uterus had steadily increased in size and was much denser than before, and bosses could be made out on the surface. On one occasion I remember that I had a member of this Society, an excellent surgeon and pathologist, examine the patient with me, and he pronounced it a case of sarcoma on account of the stony hardness of the cervix. I subsequently had a consultation with Dr. T. Betton Massey, a fellow-member, well known to us all as an expert in electro-therapeutics, in regard to the applicability of electrolysis to the growth. At this time I tried to introduce an exploring needle into the growth through the abdominal wall, but found the tissue almost like bone; subsequently I turned the case over to Dr. Massey, who treated her with excellent results by the Apostoli method. Under this treatment the tumor has become distinctly smaller. She now suffers no pain or inconvenience, and menstruates without difficulty. As I stated at the beginning, I regard this as an exceptional case; but, on the other hand, I am not as yet prepared to subscribe to the propriety of performing laparotomy in all cases of fibroma uteri.

An interesting point is that in 1874 she was willing to have the uterus removed, and indeed suggested the operation to me, but as I was able to afford her relief without it, I dismissed it on account of the risk; moreover, these operations were not as familiar to us then as now. Her general health has been very good, she has suffered very little, and during these many years she has been comfortable and able to earn her living by housework. The notes of the case may be found by consulting Dr. Massey's book.[1]

DR. CHARLES P. NOBLE.—I wish to say a few words on the subject of the diagnosis of pregnancy. I think that there are cases in which the best of men may make a mistake in diagnosis as to the presence or absence of pregnancy. These are cases in which the pregnancy is complicated by a tumor, or cases in which the position of the uterus is altered, and in which the pelvis is more or less filled with inflammatory masses. I have myself seen one case in which I made a correct diagnosis at the fourth month of pregnancy, and after watching the case for two months gave up that diagnosis. It was afterward demonstrated that she was preg-

[1] Electricity in Diseases of Women, 2d ed., Phila., 1890, p. 147.

nant. The diagnosis in the first place was made partly from the physical signs and partly from the history, which was one of arrested menstruation for four months. There was a pelvic tumor continuous with the cervix, occupying the pelvis—apparently an adherent retroflexed pregnant uterus. After watching the case for two months, and finding that I could not hear the fœtal heart-sounds nor detect the intermittent contractions of the uterus, which should always be felt at this time, I gave up the diagnosis and she passed from under my care. I learned that an autopsy made later showed that the woman was pregnant, and had a tumor of the anterior wall of the uterus, which prevented one from hearing the fœtal heart-sounds and from feeling the intermittent contractions of the uterus. I can easily see how one might make a mistake where there was a uterine or other tumor in front of the uterus, but feel satisfied that if the cases are carefully investigated, mistakes of this kind will be very infrequent. It would be a great advantage to every practitioner if, when engaged to attend women in confinement, he would take every reasonable opportunity to become familiar with the feeling of the pregnant uterus. This is not only a great advantage to the pregnant woman and to the practitioner in the immediate case, but also educates the physician to distinguish between different conditions in the future. Such a course would enable the practitioner to recognize deformities of the pelvis and malpositions of the fœtus, and prepare for the proper treatment, and to become acquainted with the rhythmic contractions of the uterus. The only circumstances in which error might arise would be in cases of retained menstrual fluid, where the history would put you on your guard, and in some muscular tumors of the uterus which are said to present more or less typical intermittent contractions. Broadly speaking, when we have an abdominal tumor presenting rhythmic contractions, we can be satisfied that we have to deal with pregnancy. This sign is more reliable than the fœtal heart-sounds for the reason that if the fœtus is dead or there is a large amount of liquor amnii they are not to be heard.

Dr. James Collins.—After the rich experiences brought forward on the other portions of Dr. Price's paper, I feel that I may detain you for a moment with a reference to the case of impaction of gall-stones. These cases, I believe, are more frequent than one would suppose. I am glad that Dr. Price has given his experience. I recall two or three cases, and one especially, in which, after a long struggle and threatened obstruction of the bowel, a gall-stone the size of a pigeon's egg was passed, and the patient was relieved. In another case I begged the consultants to permit the abdomen to be opened, but they would not agree to it. At the autopsy we found that a large gall-stone had formed; that adhesive inflammation had taken place between the gall-bladder and intestine; ulceration had occurred, and then the stone had entered the bowel and lodged in the ileum, causing complete obstruction. This case occurred ten years ago. I have seen another autopsy in which a similar condition of things was found. I believe that this happens not infrequently.

Dr. Marie B. Werner.—The treatment of ectopic gestation has always interested me greatly. In discussing this subject with Professor Winckel, of Munich, I found his favorite way of treating it was with one to three injections of morphine (0.05) into the amniotic sac, feeling confident that absorption will take place. I asked him what he did in case of hæmorrhage. He replied that the blood could be disposed of by the peritoneum. Subsequently, in conversation with Dr. G. G. Bantock, of London, in regard to the disposal of the blood, I learned that he considered operation imperative. He believed that the blood would not be entirely absorbed, but that portions would become organized and produce adhesions, provided the patient escaped death.

One of the cases reported by Dr. Price to-night clearly shows that nature would have been unable to dispose of the blood, since omentum and intestines were so completely covered with clots that he found it difficult to separate them, and proves to me that, aside from arresting the flow of blood, the necessity of cleansing the peritoneal cavity of foreign matter is distinctly called for.

These points have been of interest to me, and I thought that they might be of interest to the Society.

Dr. John B. Roberts.—I have been especially interested with reference to tumors of supposed malignant nature in the abdominal cavity. The fact that we often make diagnosis of malignant disease which are not substantiated by the subsequent histological examinations must be borne in mind. I am reminded of a case which occurred in my practice two years ago, where there was an abdominal growth which I believed to be a malignant tumor of the colon. On making an incision I came down upon a growth attached to the internal surface of the ab-

dominal wall, and, cutting through it, I found that it was a large growth of the omentum adherent to many coils of intestines. I felt sure that it was a sarcoma. I removed it as thoroughly as possible, probably getting it all away. It was referred to a competent pathologist, and found to be simply a lipoma of the omentum. I had assisted a friend a few weeks before to remove a tumor almost identical in appearance, and this has shown itself clinically to be malignant. The determination of the question whether or not these supposed cases of malignant disease are really malignant or simply a softening, or colloid degeneration of tumors of a hard nature, is, I think, important.

DR. WILSON BUCKBY:—Twenty-one years ago a bit of information was given me by Dr. Atlee, who may be said to be the Father of Gynæcology, notwithstanding the pioneering of McDowell. He said that menorrhagia was due in ninety-nine cases out of a hundred to the presence of fibroid tumors, and that in the early stages they were amenable to medical treatment, and that the degenerative processes which take place are due to the neglect of the proper medical treatment in the early stages. I called him in consultation in a case of extreme menorrhagia, where the woman was almost exsanguine. He advised me to use sea-tangle tents, as was then the custom, and to make a thorough application to the interior of the uterus. He held that nine times out of ten the fibroid tumor was capable of being absorbed by his stimulating application, which consisted of compound iodine, iodide of potassium, and carbolic acid in glycerin. This was swept over the interior of the womb, and internally was given the old-fashioned ergot. My experience has been that in many cases this treatment will enable you, with benefit to the patient, to delay surgical interference.

DR. PRICE:—In regard to my case of sarcoma, I would say that spindle-celled sarcoma is one of the most benign tumors of the uterus. I have had a number of cases, some of which were operated on a number of years ago, and they are absolutely free from disease. The tumor which I have reported was entirely of a different nature; it was attached to everything in the pelvis. The least touch would cause bleeding, and you could scrape out great handfuls of brain-like tissue. It was impossible to remove it all, on account of the adhesions. All that could be removed with care was taken away, and the patient is doing well. I do not believe that she will remain well. Fibro-sarcoma or spindle-cell sarcoma of the uterus is a very curable disease, and almost invariably is non-adherent. When removed it gives no further trouble.

In regard to the question of concealed pregnancy, I would say that in neither of the cases I have related did the physician examine the patient at all. Most of us in treating these cases treat them by simply looking at them without any examination; but if we attempt to do this kind of work, I think that we should go to the bottom of the condition. I do not believe that there is such a thing as concealed pregnancy—such a thing as a child of any size in the uterine cavity or outside of it. Is it not our duty to find it. If there is any question of doubt, we should wait until sufficient time has elapsed, for pregnancy, unless of the extra-uterine variety, gives no urgent indications for interference. The case referred to by Dr. Noble is one in which both the mother and child were sacrificed by attempting to remove what was thought to be an ovarian tumor. A little delay would have rendered the diagnosis clear.

I agree with Dr. Ashton in regard to appendicitis. I am confident that we are too timid in these cases. If there is the slightest shadow of a doubt as to the septum between the abscess cavity and the peritoneum, it is our duty to break through and irrigate the whole peritoneal cavity. I have seen my brother operate for appendicitis five times through a median incision, tearing away all the adhesions and doing a complete operation. In the case I have reported, I tried to avoid opening the general peritoneal cavity, but when I passed two fingers to irrigate, I found that the peritoneum was opened, and I therefore loosened up everything and washed out the peritoneal cavity, and the result was favorable. A physician in this State was taken ill and appendicitis was suspected, but a delay of twenty-four hours was advised in order to clear up the diagnosis. The diagnosis was cleared up by the man's death inside of that time. If you suspect appendicitis, explain clearly to the patient the condition you suppose to exist and the danger of the two methods of treatment—the delay method and that by exploratory operation. An exploratory operation under proper surgical methods, with absolute cleanliness, has no business to cause more trouble than a simple vaccination.

Now in regard to hysterectomy. If there is a suspicion of malignancy, it is our duty to remove the uterus. If the tumor is a

pure fibroma and the woman is near the period of the change of life, it is our duty to let it alone. At the change of life the tumor undergoes retrograde changes. The same occur where the appendages are removed. In nine cases out of ten, the appendages are diseased and they supply the stimulation to the growth of the tumor. The removal of the monthly congestion removes the cause of the growth, and at once you have a cessation of the growth of the tumor and the commencement of retrograde changes. The operation of the removal of the appendages is wholly useless in œdematous fibromas and fibroids undergoing cystic degeneration. In such cases it is folly either to wait or to remove the appendages; hysterectomy is the only treatment.

Dr. Collins has beautifully spoken my mind on the subject of gall-stones. In my case the transverse colon was immediately under the tumor and there was nothing to hinder the occurrence of adhesions, ulceration, and the discharge of the stone into the bowel; but in many such cases the patient will probably die from leakage into the peritoneal cavity. The ulceration may be outside of the position of the bowel, and it is our duty to open the abdomen and take out the stones.

A word as to the method of treatment mentioned by Dr. Buckby as having been recommended by Dr. Atlee. I have a supreme admiration for Dr. Atlee and the whole Atlee family. They have done more, with McDowell, for woman-kind in this land than any others, and have established on a firm foundation a condition of surgery that to-day, even in my own hands, has saved more than one hundred lives. The kind of fibroids that will be relieved by such treatment are not fibroids. They are either badly treated abortions or granular conditions of the endometrium: a condition that can be removed by the curette. Such a uterus is as smooth as a ball. It is not nodular.

I could wish no better example than the case cited by Dr. Woodbury as proof of the value of operative treatment. This poor woman was an invalid for twenty-two years, and was then treated with electricity by Dr. Massey—driving an electrode through the abdominal wall into the tumor. This is not Apostoli's treatment, and I congratulate Drs. Woodbury and Massey that they did not have a death instead of benefit from the treatment.

There are over 40,000 physicians in Japan.

Selected Formulæ.

PILLS FOR BLENORRHAGIC ERECTIONS.

The following pills are said to produce good results in the painful blenorrhagic erections:

℞ Camphor.....grammes 2.
Thebaic extract..... " 0.20.
M. Divide into 20 pills. Sig. Four pills to be taken in the evening, one every 15 minutes.

—*Journ. de Malad. Cutan. et Syphilit.*, October, 1891.

INJECTION FOR LEUCORRHŒA.

Heuske recommends the following injection for this disease:

℞ Chlorate of potassium.....grammes xxx.
Tincture of opium..... " xxx.
Tar water..... " cccclxx.
M. Sig. Two or three tablespoonfuls to be placed in a litre of lukewarm water, for vaginal injections, morning and evening.

—*Revista de Ciencias Médicas de Barcelona*, Oct. 25, 1891.

CHLOROTIC DYSMENORRHŒA.

The following mixture is recommended by Monin, for the above affection:

℞ Tincture of honey.
" of saffron.
" of iodine, aa.....grammes xv.
M. Sig. Twelve drops before each of the principal meals. At the same time, every 8 days a warm bath, to which 125 grammes of chlohydrate of ammonium is added should be taken.

—*Journ. de Méd. de Paris*, Nov. 1, 1891.

NAPHTHALIN IN THE TREATMENT OF SEAT-WORMS.

Naphthalin has been applied by Minerbi in the treatment of seat-worms. The author was able to completely cure 11 children, suffering from these parasites, in 8 days. The formula employed by him was as follows:

℞ Naphthalin.....grammes 1 to 1.50.
Olive oil..... " 40 to 60.00.
M. Sig. For a rectal injection.

For adults the following was used:

℞ Naphthalin.....grammes v to vj.
Olive oil..... " lx to lxxx.
M. Sig. For a rectal injection.

—*Journ. de Méd. de Paris*, Nov. 1, 1891.

POTION FOR BRONCHO-PNEUMONIA IN CHILDREN.

According to J. Simon, the following is an excellent potion to be employed in infantile broncho-pneumonia:

℞ Acetate of ammonium.....grammes 0.50.
Tincture of aconite root.....gtt. xv.
Syrup of codeine.....grammes v to viij.
M. Sig. A teaspoonful every hour at the beginning of the disease.

—*Journ. de Méd. de Paris*, Nov. 1, 1891.

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LEADING ARTICLE.

THE NEW TREATMENT OF PNEUMONIA BY LARGE DOSES OF DIGITALIS.

We have certainly entered a new era in regard to the treatment of one of the most common and dangerous of affections: pneumonia. The routine practice of blood-letting and the administration of tartar emetic will now be laid aside, to be superseded by the employment of a drug that bids fair to become almost a specific in the disease under consideration.

Traube, Wunderlich and others who first employed digitalis in large doses, noticed good effects, and following the teaching of these investigators, Petresco and more recently Huchadert, Bardet and Tikl, have tried the drug with most gratifying results. Petresco, more extensively, perhaps, than other observers, has especially investigated the subject, and since he first began to employ the remedy he has entirely abandoned all other therapeutic measures. Before 1883, this author was a confirmed believer in the tartar emetic and blood-letting treatment; but all this was immediately abandoned after he began to employ large doses of digitalis. Petresco claims that the drug does good not only in infectious croupous pneumonia, but even in broncho- and pleuro-pneumonias. He asserts to have cut short the disease by this sole treatment, in from 24 to 48 hours, during which time he has observed an abrupt fall of temperature, from 106.5° F. (the highest seen) to 98°, 96 ½°, and even 95° F., together with a marked reduction of the pulse, which from as high as 140, and even higher, was brought down to 60, 40, 30, and, in one remarkable instance, to as low as 24. In the last case the patient fell into a quiet sleep, this being followed by a local and general improvement. The author has compared the results obtained under the action of digitalis with those observed in the treatment by other drugs, such as alcohol, bromide of potassium, caffeine, stropanthus, and also with those offered by the expectant and emetic methods, and finds

that, taken all in all, digitalis is far superior in every respect. His statistics are certainly very interesting and fully sustain his assertions. Thus, in 825 cases treated by him since 1883 exclusively by large doses of the drug, he has only had a mortality of 2.06 per cent. Bennet, it will be remembered, obtained under the tonic treatment, a mortality of 3 per cent. in 129 cases; and a mortality of 6.08 per cent. in 720 cases under the expectant treatment. In the experience of Edinbourg in a record of 698 cases treated by venesection alone, the mortality was 34.05 per cent., which speaks for itself.

Petresco communicated the excellent results obtained by him under the new treatment to the Paris Academy of Medicine in 1888, to the Therapeutic Congress of 1889, and, lastly, to the recent International Medical Congress held at Berlin. Yet, up to a comparatively short time, Petresco had few followers. In November, 1890, Huchardet and Bardet presented to the Societé de Therapeutique the results obtained by Chardet in the clinical wards, and by Bardet in the Laboratory from a series of experiments on animals. Both authors agreed that the doses of digitalis should be considerably larger than those generally employed. Petresco has been in the habit of using from 60 to 90 grains a day, in infusion, for three and four days consecutively. With these quantities the author has never noticed untoward effects, such as vomiting, diarrhœa, disturbances of the pulse, and much less collapse.

The latest contribution to the subject is that of Tikl, of Vienna. His results have been most gratifying. This distinguished practitioner has made, up to the present time, 61 carefully studied observations, of which 47 were cases of fibrinous, and 14 of lobular pneumonia. All these cases were exclusively treated with large doses of digitalis. Only one death occurred out of this number, giving, therefore, a mortality of only 1.65 per cent., a gratifyingly low figure. In the whole series of these cases, some disagreeable, but not fatal, symptoms were observed: in two, there was a moderate collapse; in twelve, vomiting; in four, an intermittent pulse; and in a few, slight diarrhœa. These effects, however, disappear on the suspension of the drug, after which the good results come on rapidly. Tikl prescribed, during 24 hours, 3 grammes of the digitalis in 200 grammes of water in the form of infusion. According to the author, digitalis shortens the period of the disease, and causes it to assume a benign character. From the 2d to the 3d, or, at least, the 5th day, the temperature begins to decline, and *pari passu* with this phenomenon there is a gradual decrease in the cardiac rate, together with a marked amelioration of the general condition of the patient.

These observations of Tikl coincide with those of Petresco and it would seem as if in the use of digitalis, in the quantities indicated, we have a most valuable method for the successful treatment of pneumonia; a method, in fact, superior so far, to all others.

Correspondence.

PROMISCUOUS SPAYING OF WOMEN.

Editor of the Medical and Surgical Reporter:—In the issue of the Reporter for November 14th, 1891, there appears a letter from Dr. Todd with the above title. In it the Doctor reports that four cases of abdominal section for the removal of the ovaries have come under his notice, of which one died and three recovered; also that several patients did not understand the nature of the operation, and that one, a young married woman, was not relieved of irritability of the bladder a few weeks after the operation, and that he had regarded this case as one of nervous temperament, and irritable bladder due to marriage. He makes this report the basis of a severe criticism of modern gynæcologists, imputing to them the base motive of operating for operation's sake, and intimating that the ovaries are removed for all sorts of gynæcological diseases.

It is to be regretted that Dr. Todd has not been more definite, and that he has not furnished the evidence upon which he has based his animadversions. He says nothing at all concerning the nature of the diseases for which three out of four of the operations mentioned were performed. Hence we are left in the dark as to whether the indication was a pus tube, an ovarian cyst, or a tumor

of the womb. The fourth case he says was one of irritability of the bladder which he attributed to a nervous temperament and a recent marriage; but the evidence on which he based his opinion is not given. Did he make a careful pelvic examination? Did the recent marriage relation irritate the bladder through gonorrhœal infection, or by irritating a dermoid tumor previously quiescent? These matters we do not know, nor do we know what the surgeon found when he operated. Hence, with reference to the four cases in question, the intelligent reader is absolutely at sea as to whether the respective operations were indicated or not. All that we know or can reasonably infer is that the treatment which had been employed before these women consulted the surgeon had failed to afford relief, and that their sufferings were such as to induce them to seek relief through operation.

My object in writing this letter, Mr. Editor, is not so much to point out the deficiencies in the criticism of Dr. Todd, as to enter an emphatic protest against the baseless assumption of not a few members of the profession that gynæcologists are engaged in removing healthy ovaries. They say "it is the fashion now to remove the ovaries for all sorts of conditions." Let them fortify their statements with the proofs. I am not familiar with a single gynæcologist who advocates the removal of the ovaries, except for incurable disease of the ovaries themselves, or of the Fallopian tubes, or for the uterine fibromyomota. In exceptional cases, when the social status of the patient prevents her from obtaining the conditions necessary to a cure in cases of defective development of the sexual organs, and of ovaritis, this rule is departed from when life is made miserable by the morbid condition present. Nevertheless, the broad rule laid down is adhered to, and prominent operators one and all deny that they depart from it, and repudiate the allegation that they remove healthy ovaries. This being the case the burden of proof rests with those whose statements in general are unaccompanied by evidence. A very curious and interesting point is that those who say most about the removal of healthy ovaries do not base their statements upon personal observations of specimens removed. To make such charges against the gynæcologists of to-day and to impute the motives underlying their work is to say that that field in medicine which requires the firmest convictions, the greatest courage and judgment, the greatest manual dexterity and the most faithful attention to details, to ensure successful practice, has failed to attract to its service worthy successors and followers of McDowell, Atlee, Sims, Wells, Keith, and others, who have done so much for the science of medicine, and to perfect the art of surgery. If there be black sheep in the flock, gynæcologists will welcome their exposure; but let not the sins of these, if such there be, be imputed to all.

Ill-founded charges of the kind under discussion do great harm. Physicians who are unable to follow the work of surgeons receive a false impression, and they in turn convey this impression to their patients. And so many a poor woman whose life or whose health depends upon surgical aid, rejects it, because she has been led to believe that the surgeon "only wants to use the knife" and that the gynæcologist wishes "to remove healthy ovaries." This is no fancy picture, but one which I have not unfrequently seen.

The limits of a letter will not permit me to refer to the more than questionable use of the terms "spaying" and "unsexed" as applied to women whose uterine appendages have been removed for disease—perhaps more often of the tube than of the ovary—nor can I consider now, the serious statement that in one case the uterine appendages were removed without the knowledge of the patient; but my object is accomplished when I insist that it is a most serious thing to impute the motives of men as a class, and that it should be done only upon the most indisputable evidence; and, further, that great harm has been done, and is being done, not only to the profession but to unfortunate sick women, by what I may call the present fashion of making loose statements about operating gynæcologists.

Very respectfully yours,

CHARLES P. NOBLE, M. D.

IS TYPE-WRITING INJURIOUS TO THE EYES?

TO THE EDITOR OF THE MEDICAL AND SURGICAL REPORTER:—I have been not a little interested in the article in the issue of the REPORTER of November 21st, "Is Type-Writing Injurious to the Eyes." As I am engaged in short-hand and type-writing nearly all the day long, I think that I am prepared to answer, and my reply is in the affirmative; and not only are the eyes troubled, but the head as well. After type-writing all day my head has ached very much, and my eyes have been so weak that when I have struck the open air they became filled with water, and I could scarcely see

around me for a few minutes. This constant strain upon the eyes and head cannot do one any good; and those affected in this way should drop such work.

The question arises in my mind, does not writing at the desk affect one's eyes and head also? I do not think that it does as much as type-writing, because in the latter one has to keep looking at the keys and at the work that he has done to see that it is correct, and hence a greater strain is inevitable.

A. T. SHERMAN, M. D.,
Brooklyn, L. I.

BOOK REVIEWS.

PRACTICAL INTESTINAL SURGERY. By FRED. B. ROBINSON, B. S., M. D., Profe-sor of Anatomy and Clinical Surgery, Toledo Medical College, Ohio. Two volumes, 8 vo. pp. 172–206: Being two parts of The Physician's Leisure Library. George S. Davis: Detroit, 1891.

The appearance of this work is timely. The last five years have marked a great advance in our knowledge of the surgical diseases of the intestines and in the technique of operations on these structures. This is made available to the profession in the present book, at the modest price of fifty cents.

The author has written from the standpoint of the experimenter upon animals, and he has borrowed almost exclusively from similar workers; hence, we find but little of the traditions of the elders. Volume one treats of the alimentary canal, the peritoneum, the mesentery, peritonitis, adhesions, diagnosis of intestinal obstruction, with abdominal section therefor; technique of intestinal surgery, omental grafting, intestinal anastomosis, intestinal invagination and volvulus. Volume two treats of gastro-enterostomy, patency of the ileo-cæcal valve, intestinal obstruction, resection of intestine, gastrotomy, Senn's hydrogen gas test, gunshot wounds of the intestine and abdomen, actual and experimental, with concluding propositions and an illustrated appendix showing various operations upon the alimentary canal. In short, the work is a full exposition of the subject. The style is plain but not elegant. Records of the various experiments are scattered throughout the book. The author himself has contributed four things to intestinal surgery: segmented rubber and rawhide plates for anastomosis, a new invagination operation, and a modified Jobert's operation. Finally, it is not too much to say that not only for what it contains but for what it suggests, the work should be read by every one dealing with the diseases of the alimentary canal.

PERISCOPE.

THERAPEUTICS.

ADMINISTRATION OF CREOSOTE.

Among the methods proposed for disguising the disagreeable taste of creosote when in mixture, the following appear to be the most preferable (*Rép. de Pharm.*, September 10th):

1. *In Milk.*—Dissolve the creosote in a definite quantity of rum, or in alcohol of 60 per cent. and add a measured quantity of this, containing a proper dose of creosote, to warm milk strongly sweetened with sugar.

2. *In the following Mixture.*

		About:	
Creosote	10 Gm.	160	grains.
Alcohol, 80 per cent	250 "	10	fl. oz.
Glycerin	100 "	3	"
Syrup of Tolu	500 "	10	"
Cherry Laurel Water	70 "	2½	"
Water	70 "	2½	"

Dose: 10 Gm. (or about 135 minims), containing 0.10 Gm. (or 1.6 grains) of creosote. The proportions may of course be somewhat varied to accommodate themselves to our usual measures.

METHYLENE BLUE IN MALARIA.

As it has been shown that both in dried and fresh blood preparations the malaria plasmodia can be perfectly colored by methylene blue, and as in both warm and cold-blooded animals it colors the red blood corpuscles, Drs. Guttmann and Ehrlich hit upon the idea of trying it therapeutically in malaria. Their expectations have been realized, and the investigators have shown that methylene blue exerts a decided action on malaria poison. The febrile attacks ceased the first day of its use, and in eight days at the latest the plasmodia disappeared from the blood. The form of drug employed was the chemically pure prepared by Meister, Eucius, and Bruening. It was given in doses of 0.1 grm. in capsules five times a day in the fever free interval. In the first case it was given every three hours, in two cases of quotidian the five doses were given at hourly intervals. The remedy must be continued in daily doses of 0.5 grm. for at

least eight days after the cessation of the fever. No disagreeable by-effects were observed, except slight bladder irritation. The daily excretion of urine was also observed to be increased. The urine was colored intensely blue. The intestinal evacuations contained the methylene blue in a reduced form, but they became blue on exposure. It was not ascertained whether the drug would prevent relapses.

UNTOWARD SYMPTOMS FROM THE ADMINISTRATION OF MERCURY.

Dr. Streffer, in his inaugural dissertation at the University of Würzburg, gives some statistics of untoward symptoms in the various methods in the administration of mercury, his material consisting of 453 cases from the Lock Hospital. He pays particular attention only to stomatitis, dysentery and brain symptoms, and arrives at the conclusion that the injection method produces the least percentage of untoward symptoms and that salicyl and thymol-mercury are the best combinations for the purpose, the former producing stomatitis even more rarely than the thymol-mercury; while the peptone compound is the best of all soluble mercurial preparations. In children mercurial ointment or baths and the internal administration of calomel were tried, and in one case sublimate was injected, all of these methods proving successful, but none more so than the ointment.—*Lancet.*

BRYONIA ALBA AS A REMEDY.

Dr. Huchard (*Rivista Clinica e Therapeutica* 1891) calls attention to a very old remedy, which has during our own time escaped attention, namely, bryonia. Bryonia is a member of the Cucurbitaceæ. The part of the plant used is the root, which may attain the size of a man's arm, or even the thigh. The root is fleshy and yellow in color, while its juice is acrid and bitter. In the spring it is full of a white, irritating, and drastic juice. Its active principle is called bryonine. This remedy is one of the most ancient of medicines. Dioscorides praises its purgative and diuretic properties. Boerhaave used the dried root in wine as a cathartic in the treatment of dropsy. Harmand du Montgarny (1783) called it "the true European ipecacuanha," and used it in dysenteric diseases. Bryonia is a hydrogogue purgative which causes profuse watery stools, similar to those of jalap or senna. Too strong doses cause poisoning and a choleriform state. Huchard recommends the remedy as a purgative, 3 grammes (45 grains) of the powder at a dose, this dose producing in a case of hypertrophic cirrhosis with constipation five liquid stools and slightly colicky pains; he also recommends it in whooping-cough, febrile diseases and inflammations of the respiratory tracts; in bronchitis, pleurisy, pneumonitis, etc. Bouchet used the tincture in febrile diseases. Dr. Louvet-Lamarre used bryonia in whooping-cough, where it diminishes tracheo-bronchitis, but does not shorten the duration of the disease. The dose is 1 gramme (15 grains) per day for a child of 7 years. During the spasmodic stage Lamarre prescribed the tincture of arosera, 1 gramme (15 drops) per day. Huchard uses a larger dose, 2 to 5 grammes (30 gtt. to 1¼ f℥) of the tincture. The two remedies may be associated, 1 to 2 grammes of bryonia tincture to 2 to 5 grammes of arosera. The powder may be given ½ to 4 grammes per day.—*Cincinnati Lancet-Clinic*, September 19th, 1891.

ATROPINE IN HEART DISEASES.

Dr. Cardarelli (*Norsk Magazin for Lægevindenskaben*, No. 4, 1891) has found that atropine is doses of one-half to two milligrammes (1-128th to 1-32d of a grain) injected subcutaneously removes the inhibitory influence of the pneumogastric. The pulse increases in frequency and the blood pressure diminishes. Hence atropine is indicated in irritation of the pneumogastric. Whenever a slow pulse, with dizziness, convulsions and syncope, are present, atropine is indicated.

OXYGEN AS A REMEDY IN CHLOROFORM NARCOSIS AND CHLORAL POISONING.

The therapeutic action of oxygen, taken by inhalation, has an imperfectly recognized position with the profession at large. The *Medical Press and Circular* for June 3d, speaking for the English medical faculty, states that the remedial employment of the gas has, in Great Britain, "been almost discontinued, chiefly for the reason that until quite recently the difficulty of procuring a supply of the pure gas and the delay, trouble, and expense attending its administration did much to prevent it occupying such a place in the therapeusis of the practitioner as its known physiological effects warrant." At the present time, however, the compressed gas in iron bottles can be obtained from the apothecaries in the English cities "with the same facility as any

other drug." The writer regards with surprise the unaccountable fact that one of the most active of therapeutic agents has been so little used that it may be said to have no place in practical therapeutics. As a quick and efficient respiratory and cardiac stimulant it is deserving of more frequent employment in cases of asphyxia, whether resulting from poisonous gases or general anæsthetics.

In the suffocation of angina pectoris, the writer says, the beneficial action of the gas has been abundantly proved, and among other cases occuring latterly was that of Gen. Philip Sheridan, in which the treatment followed was like that of Dr. Robert Reid, of Dublin, who, in 1817, used and advocated the gas as a practicable remedy for this affection. One of Dr. Reid's cases was that of a man, aged sixty-four, who had suffered greatly from angina, and who obtained an amount of relief from oxygen by inhalation that no other agency gave him. The effect of the gas is, however, generally temporary, but life may often be saved by a temporary tiding over of the suffocative attack. The writer quotes from a recent number of the *Nineteenth Century* a case of gas poisoning which was successfully treated by oxygen inhalation. A soldier was found apparently lifeless and pulseless in consequence of having been exposed for a considerable time to coal gas from a burst balloon. An officer of his command bethought himself of a bottle of compressed oxygen as a possible antidote. A tube having been attached to the bottle, its mouthpiece was conveyed to the man's mouth. The oxygen was liberated through the tube and appeared to force its way into the man's lungs and to become an immediate stimulant to the respiratory organs. In from ten to fifteen seconds from the first outrush of the oxygen gas the man, who had just before presented the aspect of a livid corpse, became agitated with paroxysms of a violence so marked that it was deemed expedient to order four of his comrades to hold him quiet. A half-hour later the man was calmly walking back to the barracks, all danger being at an end. The writer accepts both the authenticity and promptness of the recovery in this case as a lesson in the treatment of cases of poisoning with carbon gases, especially those of the methane series. He also commends it to the attention of all who are concerned in the administration of anæsthetics, and remarks: "How much better a whiff of pure oxygen than artificial respiration in chloral poisoning and chloroform narcosis!"

So far as the writer's knowledge extends, there are only two publications in which any advocacy has been made of this plan of treatment—namely, the work of Mr. George Foy on *Anæsthetics*, and M. Demarquay's *Pneumatology*. The writer adds: "Hospitals are provided with electric batteries to resuscitate the asphyxiated and to stimulate the respiratory function, but a more useful and active remedy, oxygen, finds no place in the emergency apparatus of the operating theatre. We hope, however, soon to be able to report that all our general hospitals are provided with a stock of oxygen gas and a suitable apparatus for its administration."

In a later number of the *Press and Circular* a retired army surgeon adds the suggestion, germane to the foregoing, that a supply of oxygen might with propriety be made a part of the medical supplies of military stations, for emergencies by drug poisoning narcosis, and other forms of asphyxiation. Oxygen may be serviceable in the after-treatment of surgical cases. Dr. A. W. Catlin touches upon this subject in the *Brooklyn Medical Journal* for August, in an article entitled, "Oxygen as a Distinct Remedy for Disease and a Life-saving Agent in Extreme Cases." He observes that after prolonged surgical operations, where the patient has been "thoroughly saturated with the anæsthetic," and where as a consequence recovery is tardy and convalescence is unsatisfactory, oxygen may be administered and will be found to enhance the reparative functions of assimilation and to quicken local repair. Oxygen is a great burden-lifter from the heart in most cases of dyspnœa, and indirectly quiets nervous storms so that sleep is seen not infrequently to follow in the train of an improved aeration of the blood by means of its inhalation.—*N. Y. Med. Jour.*

METHYLENE BLUE IN NEURALGIA.

Dr. Immerwahr (*Deutsche med. Wochenschr.*, October 8th, 1991) has recently studied the action of methylene blue in alleviating neuralgic pain, and is of opinion that under certain circumstances the drug is a valuable agent. Thus, in two cases of facial neuralgia and in three attacks of migraine complete relief was speedily obtained. Nervous headache, alcoholic depression, muscular rheumatism, and herpes zoster were also found to be benefited by the

drug. Hence, although Immerwahr has not yet been able to try it on a large number of patients, he is satisfied with this new anti-neuralgic agent, and recommends further trials. In sciatica, methylene blue appears of no value, nor is it suited to other than nervous pain, for example, that due to ulceration of the stomach or cancer. Dr. Immerwahr administers the drug as a dry powder enclosed in gelatine capsules (2 to 5 grains for a dose), three times a day. No ill effects have attended its administration, except that after prolonged use some strangury occasionally sets in, which soon yields to small doses of powdered nutmeg. The urine assumes a blue color, which may frighten the patient unless he is forewarned of its occurrence.—*Brit. Med. Jour.*

ON SALINE TRANSFUSIONS IN CHOLERA, HÆMORRHAGE, AND CHLOROFORM COLLAPSE.

Dr. Benjamin Ward Richardson, writes in the *Lancet*, that Mr. Arbuthnot Lane and Mr. Francis Heatherly, in their late able communications to this journal revive a long-forgotten but most important subject—namely, the effect of saline solutions injected into the venous circulation in states of collapse. The phenomena of temporary resuscitation following upon such injections are amongst the most remarkable on record. In a case of Asiatic cholera treated by the late Mr. Henry Ancell, Dr. Rose Cormack, and myself, a woman of middle age sank, in the collapse, into complete insensibility. In this state we injected through a vein in the arm two pints, after Stevens' original plan, with the astounding effect that our patient became quite conscious, sat up in bed, dictated a short will, and signed it in proper form. We left the house, thinking that recovery might follow, giving directions for the steady administration of a mixture of creosote and compound tincture of camphor, a mixture which had been in my hands successful in restraining the choleraic flux. But an hour later Mr. Ancell was back to me requesting me to return with him to the patient's house. The purging had returned, and the collapse was as serious as before. Once more we injected the saline solution, with the same phenomena of resuscitation. Dr. Richardson suggested this time that the injecting tube should be left tied in the vein, that the syringe at the other end of the elastic connecting tube should be filled with saline solution and placed in a hand-basin of water kept at blood heat, and that the injection should be gently repeated so soon as any symptom of collapse should reappear. This was acted upon, and for many hours the current of injection was kept up. It was observed under this line of treatment, which was identical with that to which Mr. Heatherly adverts, this very curious practical fact, that there was never any rallying at all from the injection so long as the current of saline solution was continued as a gentle feeding current. But when they pushed in the solution freely, so that the vessels were brought by the pressure into tension, then the signs of reanimation returned. They returned with decreasing activity no less than six times, but they were always succeeded by the choleraic discharge and with spasm of the lower limbs, so that ultimately death closed the scene about thirteen hours after the first injection.

Bearing on the subject of saline injections and transfusion of blood, Dr. Richardson made at one time a large number of observations. From the fact that the harpooned whale may sometimes live for long periods after profuse loss of blood, owing to the introduction of the saline sea-water into its circulation, Dr. Richardson thought it possible that an injection of a saline solution might be effective in sustaining life after loss of blood; and more than once he witnessed in the lower animals apparent reanimation from what seemed actual death. But this only occurs when there is still some remaining circulation, and when some blood is left in the veins with which the saline substances can admix. From this he drew the conclusion that the saline did its useful work, not by any sustaining power of its own, but by its action in mixing with and forcing blood still in the vessels onward in its course. He tried thereupon to produce an artificial saline fluid, like blood itself, that would convey the proper elements and would oxidize in the pulmonary circuit. In this direction he made one good advance. He discovered that if fresh venous blood were added to a saline solution sufficiently charged with proper saline substance to sustain the even fluidity of the blood, such solution, warmed up to natural blood heat, was the best of all injections for restoring the phenomena of life. In the course of his Croonian lecture to the Royal Society Dr. Richardson suggested that blood added to a saline solution might be dried down so as to be kept, in sealed bottles, ready for use in transfusion; but he believes now it would be most practical to add freshly drawn venous blood to the saline solution at the time it was wanted.

A saline solution, consisting of thirty grains of chloride of sodium and fifteen grains of phosphate of soda in a pint of distilled, water, takes up and holds in even solution at blood temperature ten fluid ounces of fresh venous blood, if the blood, as it flows from the vein, be caught in the solution whilst cold and be gently stirred into it with a clean glass rod. This, he conceives, would be the best of all fluids for venous transfusion in the collapse of cholera and hæmorrhage, in both of which emptiness of the circulatory cavities is the cause of the collapse. In extreme chloroform or methylene collapse, where no blood is lost, a portion of the saline solution alone, with the addition to it of five minims of strong solution of ammonia or a fluid drachm of the aromatic spirit of ammonia to twenty fluid ounces of it, would be a good venous injection in conjunction with artificial respiration. For injection purposes the automatic syringe, which Dr. Richardson exhibited at the Medical Society of London, last session, fulfils every intention. It prevents admission of air into the vein, and in working it the operator has simply to move the piston up and down in order to fill the barrel from the source of supply by the up stroke, and propel the charge onward, by the down stroke, into the circulation.

MEDICINE.

TYLOSIS PALMÆ ET PLANTÆ.

Dr. Radcliffe Crocker (*Brit. Journ. of Derm.* June, 1891, p. 1) relates a case of this disease in which the thickening of the palms and soles was preceded by general irritation of the skin. After six months itching all over the body, bullæ began to appear, and after a condition of dry skin, the patient (a woman, aged 56) began to sweat profusely, and within a year of the first appearance of irritation in the skin, the epidermis of the palms and soles began to thicken. Eighteen months after the first appearance of this disease the body was thickly covered with erythematous patches of a bright red color representing the sites of previous bullæ, whilst there were numerous bullæ from a pear to a pigeon's egg in size present on the trunk, and a few on the limbs. There was profuse hyperidrosis, and the author considers the question of hyperidrosis being an etiological factor in relation to palmar and plantar thickenings as worthy of further investigation.—*Brit. Med. Jour.*

PREVENTABLE BLINDNESS IN THE YOUNG.

Dr. C. D. Conkey, in discussing, in the *Northwestern Lancet*, this important and neglected subject reaches the following conclusions:

1. That the largest proportion of blindness in the young can be prevented.

2. That the majority of cases of blindness develop in the practice of the general practitioner, in the course of the invasion of the grave diseases of childhood, or as a sequence to these, or as a result of a contagious leucorrhœa in the mother.

3. That to successfully prevent them, prophylactic measures should be adopted in all cases where danger is suspected, or where the eye shows a tendency toward inflammatory action.

4. That the physician should be sufficiently acquainted with eye diseases to treat them skilfully when the eye becomes invaded.

5. After all severe attacks of the diseases of childhood the patient's sight should be carefully tested before he is dismissed as convalescent.

If these precautions were carefully observed, he is confident that the percentage of blindness would be greatly reduced among the young, and to the many thousand children that yearly become blind would be preserved this most precious of all the senses.

ANALYSES OF TWO HUNDRED AND SIXTY-CASES OF CHOREA.

Goodall (*Guy's Hosp. Reports*) has analyzed the above number of cases of chorea occurring in the Hospital during eleven consecutive years. Seventy-four of this number were males and one hundred and eighty-eight females. The youngest case was a female infant of one year; the oldest case a man of thirty-six years. There were one hundred and four cases that had recurrence of the disease. The smallest number of attacks occurred during the summer months. Hemichorea was present in sixty cases. In one hundred and fifteen cases the heart was normal, twenty-one of which number had had rheumatic fever. In one hundred and thirty-five cases there was some cardiac or vascular change. As no mention is made of the presence or absence of hypertrophy or dilatation, it is impossible to make out what per cent. of these the author regards as being chronically diseased.

There were eleven fatal cases, in which death was due to changes in the endocardium, emboli probably being formed in many cases. Seventy-one cases had had rheumatic fevers; in only sixteen cases did choreic manifestations precede the fever.

The family history showed chorea in twenty-eight cases, mother, brother or sister having been affected. There was no history recorded of a father having had the disease. As causes are mentioned rheumatic fever, fright (forty-two cases), irritation, pregnancy, injury.

AVOIDANCE OF STIMULANTS DURING HÆMORRHAGE.

It is customary, when the accident of hæmorrhage occurs, for the operator, or some bystander, to administer wine, brandy, or some other alcoholic stimulant to the patient, under the false idea of sustaining the vital power. It is my solemn duty to protest against this practice on the strictest and purest scientific grounds. The action of alcohol, under such circumstances, is injurious all round. It excites the patient, and renders him or her nervous and restless. It relaxes the arteries, and favors the escape of blood through the divided structures. Entering the circulation in a diluted state, it acts after the manner of a salt in destroying the coagulating quality of the blood; and above all other mischiefs, it increases the action of the heart, stimulating it to throw out more blood through the divided vessels. These are all serious mischiefs, but the last named is the worst. In hæmorrhage the very keystone of success lies so much in quietness of the circulation that actual failure of the heart, up to faintness, is an advantage, for it brings the blood at the bleeding point to a standstill, enables it to clot firmly, when it has that tendency, and forms the most effective possible check upon the flow from the vessels. In a case where I had to remove a hard palate, that had become carious, in order to reach and twist a bleeding vessel, although the quantity of blood lost during the hæmorrhage amounted to over three pounds in weight, and the syncope was so extreme the patient did not know anything had been done to him after he returned to consciousness, not a drop of stimulant was administered at any stage, and the care to avoid such administration was carefully sustained after recovery, in order that the rapid action of the heart might not overcome the resistance of the tenderly sealed up vessel. I am certain that this rule of avoiding stimulation was far more effective in saving my patient's life than any surgical skill of mine, for the vessel I twisted might have become plugged up, naturally, during the syncope, but nothing would have prevented the bleeding from breaking out afresh if the heart, instead of being allowed to swing round of itself, slowly and safely, had been whipped, for a brief period, into violent action. I refer to this case as typical, because if a stimulant were not wanted in it, a stimulant cannot be called for in examples less severe. The course followed was simply to lay the patient quite recumbent when signs of faintness supervened, and, so long as he could swallow, to feed him with warm milk and water freely. Such, in my opinion, is the proper treatment to be employed in every instance of syncope from loss of blood—*The Asclepiad*, vol. viii., No. 29, 1891.

SARCOMA OF THE FRONTAL BONE.

M. Ricard presented a patient on whom he had performed the removal of a sarcoma of the frontal bone, leaving exposed a considerable surface of the frontal bone. This loss of substance was supplied from the ilium of a dog completely sterilized. The union was immediate, and three and a half months after the operation the graft was perfect.—*Journal de Medicine, Paris.*

THE HYPERPYREXIA OF RHEUMATISM.

Dr. H. C. Male has prepared for the *Practitioner* a study of eighty-three cases of rheumatic hyperpyrexia reported during the twenty years ending in 1890. In fifty-five of these cases the temperature exceeded 106° F., running as high as 110·4°. In one series of cases, thirty-nine in number, all having as their maximum temperature 106° to 110°, thirty-four were treated by cold bathing, with fourteen recoveries. Of those having the more moderate pyrexia, with the maximum at 106° and 107°, eight out of eleven patients recovered under the cold-bathing treatment; all of those that were not bathed died. In the last ten years cases and recoveries have been reported from time to time in the journals, and no fewer than sixteen cases of temperatures ranging from 106° to 110° are on record. The number of recoveries was thirteen. The pack was used in eight of these, with two deaths; the bath was used in the other cases, with one death. It is not proposed from these figures to base a ratio of recoveries on a study of the re-

ported cases alone, for it is probable that many unsuccessful cases have not been reported, while the majority of the successes have without doubt been given to the journals. But these reported recoveries are a satisfactory witness that lives have been saved which under other conditions must certainly have been lost under the strain of extreme temperatures. The writer urges the importance of making a most careful record of the temperature in all cases of rheumatic fever, and of recognizing at once the earliest indications of approaching hyperpyrexia. So soon as the thermometer shows an undue rise, there should be no time wasted over the administration of drugs, but an attempt should be made at once to check this rise by the application of cold to the surface. The result of such treatment in a favorable case is most gratifying. The patient may seemingly be dying from excessive heat-production one hour, and in the next hour may be in comparative comfort, with prospects of a speedy recovery. One bathing has frequently seemed to turn the scale.—*N. Y. Med. Jour.*

SURGERY.

EXCISION OF PART OF RIGHT LOBE OF LIVER.

On October 9 Professor W. W. Keen, of Philadelphia, removed from a patient a considerable portion of the right lobe of the liver for the excision of a cystic tumor, the entire mass taken away being about two-thirds the size of a man's fist. The woman's temperature has remained normal, or nearly so, since the operation, rising only once to 100° F. There seems every reason to believe that the patient will recover.—*News.*

TRANSPLANTATION OF THE CORNEA.

Von Hippel reports in the *Berliner klin. Wochenschrift*, xxviii. Jahrg., No. 19, his seventh case subjected to this operation. The patient had a dark-brown opacity which covered the pupil, and which had been produced by repeated cauterizations of the cornea with nitrate of silver. He also had cataract. After extraction of the opaque lens, with iridectomy, he had vision equal one-fifth, but he insisted on the removal of the spot on the cornea. The corneal tissue, down to Descemet's membrane, was removed from a circle four millimetres in diameter, and replaced by the full thickness of the cornea from a young rabbit. The eye was afterward dressed with iodoform and both eyes bandaged. Although there was temporary clouding of the thin layer of original tissue behind it, the transplanted flap remained clear. In two weeks the epithelium was continuous from the cornea to the flap. After discission for a secondary cataract, the patient obtained vision equal one-third. It does not appear from the report that the transplantation caused any improvement in vision. But the operation deserves to be called successful in that it secured the continued life and health of the graft, and removed an unsightly scar.

TREPHINING IN A CASE OF GENERAL PARALYSIS.

M. Rey reported a case in which he thought the disease was benefited by the intervention of the surgeon. The dura mater presented no unusual appearance. Beneath the meninges the large vessels presented a gelatinous aspect and showed milk-like plates. The brain formed a hernia which filled up the opening in the skull. A rapid examination was made. The incisions in the dura mater were there reunited by sutures, as were also the rents in the pericranium.

The operation, which lasted an hour, was performed under strict antiseptic precautions. On awakening, the patient was quiet and contented. Eight days later, the cicatrization of wound was completed and the patient returned to ward. A month and a half later he returned to his family, the states of depression and exaltation having disappeared.

Mr. Rey remarks that cases of this kind may be benefited by the surgeon, even though there is no tumor or irritation of the brain, just as cases of symptomatic or essential epilepsy may de benefited. The incurability of general paresis and the recognized futility of internal treatment justify this operation. —*Le Progrès Médical*, August 15, 1891.

AN EASY METHOD OF PLUGGING FOR EPISTAXIS.

Dr. A. A. Philip describes a ready method of plugging the posterior nares, which in his hands is both effectual and easily accomplished. (*British Medical Journal, July* 18.) A piece of old, soft, thin cotton, oiled silk, or silk, about six inches square—a piece of an old handkerchief will answer—is taken, and by means of a probe, mental thermometer

case, or penholder, is pushed, "umbrella" fashion into the nostril, the direction of pressure, when the patient is sitting erect, being backward and slightly downward. It is pushed on until it is felt that the point of the "umbrella" is well into the cavity of the naso-pharynx.

The thermometer case is now passed on in an upward direction and then toward the sides, so as to push more of the "umbrella" into the pharynx, and is then withdrawn. The closed end of the sac protrudes well into the pharynx, and its open end protudes at the anterior nares. The inside of the sac may be brushed with some astringent, such as alum or turpentine.

A considerable quantity of cotton wool is pushed well back to the bottom of the sac in the pharynx. Then, the thermometer case being held well against the packed wool, the mouth of the sac is pulled upon, and thus its bottom is drawn forward, and forms a firm, hard plug wedged into the posterior nares. The sac may now be packed full of cotton wool, dry or soaked in some astringent solution. The mouth of the sac is tied just outside the nostril, trimmed with scissors, and the ends of the thread secured outside.

In removing the plug, open the mouth of the sac, and, with small dressing forceps, gently remove the cotton-wool bit by bit. If there is bleeding, simply syringe the sac with weak carbolic lotion or Condy's fluid, and repack with clean cotton-wool. If there is no bleeding when the wool is picked out, gently pull out the sac, or if it be adhering to the mucous membrane of the nostril, apply a little warm water, and it may then easily be removed.

By this method no damage is done to the floor of the nose or back of soft palate by strings, etc., no disagreeable hawking, coughing or vomiting takes place during introduction, and no disagreeable strings are left hanging inside the mouth.

POSTURE IN THE REDUCTION OF HERNIA.

I had, on Saturday evening last, a case which well illustrated the principles set forth in Dr. George H. Taylor's article, published in the *Journal* for April 25th.

About seven o'clock of the evening aforesaid I was called to see Mrs. R., who that evening had been digging in the garden. An hour or an hour and a half before my arrival she had developed a right, direct inguinal hernia. I found her with a hernia half as large as my fist, hard, tense, and painful; with great pain in the bowels and vomiting. After careful manipulation, finding that it would be impossible to reduce the hernia by taxis, I gave her repeated hypodermics of morphine sulphate to relieve the pain, subdue peristalsis, and prevent tympanites; elevated the hips on a board; applied ice to the tumor; and made repeated pressure, or "pulls," upon the bowels toward the diaphragm. A few minutes sufficed to produce a somewhat lessened tension in the tumor, and I felt that it would only be a question of time when reduction could be effected. Gradual diminution took place, and, finally, at 10.30, spontaneous reduction of the bowel took place, a portion of the sac still remaining down, but the latter was easily returned. I feel confident that this case could not have been relieved by taxis in the ordinary way, but a combination of taxis, posture, anodyne, and antiphlogistic easily effected a cure.

It is quite likely that many other cases, such as we have heretofore been accustomed to operate upon, might be relieved in the same way. There is, of course, nothing new in the postural treatment of hernia, *e. g.*, the hanging a man by his legs over the shoulders of another man—and then taxis. It is only in the application of the principle; the combination of gravity, atmospheric pressure, reversed rhythmical respiratory action; external abdominal pressure with the operator's hand, and persistent, patient waiting.—Dr. Thomas A. Elder, in the *N. Y. Med. Jour.*

GYNÆCOLOGY.

GONORRHŒA IN THE FEMALE.

Bumm (*Centralblatt für Gynäkologie*, 1891, No. 22) thus summarizes the results of his studies of this subject, which extend over a period of ten years:

1. Gonorrhœa in women is a process limited to the superficial layer of the mucosa; the cocci invade the epithelial layer, but are always arrested when they reach the submucosa. The epithelium is originally cast off by reason of the active suppuration, but is quickly renewed, assuming the pavement form; after this change has occurred the active invasion of gonococci is usually arrested, but they continue to grow in the secretion, in which they may persist for months and years.

2. The gonococci have no connection with septic processes; they do indeed cause

suppuration of the mucosa, but are destroyed when they reach the subjacent connective tissue. If sepsis develops it must be in consequence of mixed infection; septic germs are frequently present in gonorrhœal pus, and a favorable nidus for the reception of external germs is offered by the purulent genital secretion.

3. The urethra and cervical canal are the favorite seats of gonorrhœal infection; acute gonorrhœa of the cervix gives rise to symptoms only at the outset, but after it has become chronic it may exist for years without causing disturbances, unless it extends to the corpus uteri and thence to the tubes.

The cocci possess no power of spontaneous movement and extend only short distances by proliferation. Extension over larger surfaces must be through the agency of the secretion. Normally the cervical secretion cannot pass the os internum, which also serves as a barrier to the entrance of the specific infection. Menstruation favors the admission of cocci into the uterine cavity, also certain mechanical causes, such as coitus, the introduction of sounds and intrauterine medication; lastly, this is liable to occur during the puerperium. After they have reached the cavity they again remain stationary, and probably are only carried into the tubes from the causes already mentioned, the puerperium being the most favorable time, as the proximal openings of the tubes are then more patent. In fifty-three patients with gonorrhœa, who were kept under observation for at least five months after the initial symptoms developed, the cervix was infected in 75 per cent., the corpus uteri in 15 per cent., and the tubes in only 3.5 per cent.

Wertheim (*Centralblatt für Gynäkologie*, 1891, No. 24) reviews the subject of so-called gonococci-peritonitis, the existence of which is denied by Bumm, who affirms that when the cocci comes in contact with the peritoneum they are simply encapsulated like any other foreign bodies, the development of peritonitis secondary to gonorrhœa of the tubes being due to mixed infection. Subsequent microscopical studies have shown that the cocci may penetrate the squamous epithelium which covers serous surfaces. Their absence in the exudates of peritonitis is no proof that they may not have originated the inflammatory process prior to their disappearance. After a thorough investigation of the subject, he finds as the result of numerous experiments upon animals that the coccus may, under the same conditions, produce peritonitis the same as the other pyogenic microörganisms. Now, it may be urged that experiments on animals do not form a reliable basis on which to found a theory as to the development of this form of peritonitis in the human subject; but, as an actual fact, mucous surfaces in the former are less sensitive to the action of the cocci than those of man, hence in the latter peitonitis would be more likely to occur from contact with them. Not only may the gonococci penetrate squamous epithelium, but they may make their way into the subjacent connective tissue and there enter the lymph-spaces, extending in the same manner as other pyogenic organisms. This is an important fact, since heretofore all inflammations of the deeper tissues accompanying gonorrhœa have been referred to mixed infection; now, peri-urethral abscesses, suppuration of the glands, parametritis, and even oöphoritis, may be regarded as due directly to the influence of the gonococcus. It is a striking fact that no one has ever found any other pyogenic bacterium except the gonococcus in the contents of a pyosalpinx, even though the condition was complicated with extensive inflammatory changes in the tubes, ovaries and peritoneum.

The writer has found the coccus in the pus from sixteen cases of pyosalpinx, but never succeeded in discovering any other form of microörganism, even after the most careful search; there is no reason to infer from this that other bacteria are supplanted by the cocci, since Menge has shown that the former possess a much greater power of resistance than the latter. The writer has also disproved, by numerous culture experiments, Zweifel's assertion that old gonorrhœal pus forms a particularly favorable nidus for pyogenic and septic organisms; the reverse seems to be the case. It seems only fair to limit the term "mixed infection" to those cases in which, after a distinct preceding gonorrhœal infection, the presence of organisms other than gonococci can be demonstrated; of these the writer has seen but two undoubted examples. Abscesses of the ovary may be divided into two classes, according to their etiology—puerperal and gonorrhœal. The former are not uncommon; the *streptococcus pyogenes* is usually found in the pus. That ovarian abscess may be of gonorrhœal origin is proved by a case cited by the writer in which a girl of sixteen had a double pyosalpinx and abscess of both ovaries; in the contents of the right abscess-sac numerous gonococci were found, while the pus from the left one contained no bacteria whatever. —*Amer. Jour. Med. Science.*

RESECTION OF THE OVARY.

At a meeting of the Surgical Society of Paris, July 29, 1891, M. Pozzi read a paper on the above subject. He stated that it often happens that the ovaries are only partially diseased. It has been proposed, in these cases, that only the affected portions be removed; that is to say, resection of a portion of the ovary. Schroeder has already done the operation for dermoid cysts, others for sclero-cystic lesions, although more often total removal has been practiced for the latter condition.

Pozzi has recently made two resections of the ovary; the operation is a simple one, and attended with the best results. It may be asked: What is the ulterior result of this conservative operation as regards fecundation? It must not be forgotten that every portion of an ovary is capable of producing an ovule. Nevertheless, he would only advise resection of the ovary when the Fallopian tube is permeable.

In one patient he found sclero-cystic ovaries on both sides, prolapsed and bound down by adhesions. The tubes were twisted. He took considerable care in loosening them from their adhesions and in proving that they were permeable. This done, he removed one ovary, and from the other he removed the middle third. Like a quarter of an orange. A catgut suture restrained haemorrhage and assured coaptation of the surfaces. He than adjusted the fimbriated extremity of the tube over the surface of the ovary, and fixed it with four points of catgut suture.

The obliteration or evident alterations in the tube, by pyosalpinx or other disease, would prove an absolute obstacle to the passage of the ovule, and should constitute a contra-indication to this operation.—*Le Semaine Médical*, August 1, 1891, p. 310.

OBSTETRICS.

HYPEREMESIS GRAVIDARUM AS A MANIFESTATION OF HYSTERIA.

German journals have lately been occupied with a discussion between Ahlfield and Kaltenbach as to the priority of having pointed out the connection between the pernicious vomiting of pregnancy and hysteria. It has been recently shown, however, that Friedreich, as early as 1878, declared the vomiting of pregnancy to be a neurosis, and recommended large doses of potassium bromide as the best treatment. Cohnstein (*Centralblatt für Gynäkologie*, No. 36, 1891) reports success with this treatment, but very properly admits that even though in the beginning the disease may be a pure neurosis, it may quickly progress so far as to be beyond a treatment by nerve sedatives alone, and further that in cases of pernicious vomiting in pregnancy dependent upon some abnormality of the stomach or intestinal tract the nervous sedatives are not to be depended upon.—*Univ. Med. Mag.*

DOUBLE UTERUS; PREGNANCY; ABORTION AT THIRD MONTH.

Dr. Thaddeus A. Reamy (*Amer. Journ. Obstet.*, July, 1891) reported the following case before the Obstetrical Society of Cincinnati. The patient was aged 25; she had borne three children, the youngest being 13 months old. The period ceased on November 29th, 1990. Nausea set in and caused emaciation. On January 21st, Dr. Schoolfield was called in, as she was suffering intense pain in the right inguinal region, with shock but no vaginal "show." A mass was felt to the right side of the uterus, extending to the fundus. Dr. Schoolfield had no doubt that pregnancy existed and, but for the absence of hæmorrhage and decidual membrane, would have felt sure that it was ectopic. On February 10th the patient was anæsthetized. The sound could be passed to a depth of but 3½ inches, the uterine cavity being empty. Two days later Dr. Reamy explored the parts. At first he penetrated the same cavity that had already received the sound; it measured 3½ inches. Withdrawing the sound, he turned its concavity towards the right side, and without difficulty introduced it to a depth of more than 5 inches. While it was thus introduced, he found no difficulty in carrying the uterus to the middle line by aid of the sound and of the hand placed externally. The abdominal wall being very thin, the outline of the uterus was easily distinguished. It was not difficult to detect a foreign body in the right cavity. Manipulation by the sound, with the deliberate purpose of inducing an abortion, Dr. Reamy then withdrew the instrument, and advised that the patient should be kept at rest. On the next day Dr. Schoolfield found a fœtus, of nearly three months' growth, expelled into the vagina. The placenta was removed without difficulty and the uterine cavity washed out with a bichloride solution. Taking advantage of the dilated condition of the internal os, Dr. Schoolfield explored the uterus with

his finger and detected a firm antero-posterior septum extending from the fundus to a point corresponding to the ring of Bandl, thus clearing up some obscure points in the diagnosis. The patient recovered. Dr. Reamy, in conclusion, observed that, according to modern teaching the facts that pregnancy existed, that a mass lay to the right side of the uterus and that the patient had been seized with sudden pain and shock, would have justified an immediate abdominal section. The subsequent events showed that such a procedure would have been wholly unjustifiable.—*Brit. Med. Jour.*

CURIOUS CAUSE OF PUERPERAL FEVER.

Professsor Paramuchi has reported a case of puerperal fever in which a very unexpected cause was brought to light—that is to say, the putrid remains of a tapeworm in the uterus. No untoward symptoms seem to have occurred until the tenth day after delivery, when the patient became feverish and prostrate and lost her appetite. The lochial secretion was very foul. Large doses of quinine were ordered, but no effect was produced on the temperature, which the next day was 104.2°. The uterus was consequently washed out, two catheters being used for the purpose, as a regular uterine instrument was not at hand. The outlet catheter, after discharging some very fœtid fluid, was choked up by what was found to be a putrid tapeworm. This was of course removed and sublimate irrigations given, and the symptoms soon disappeared. Regarding the question of how the tapeworm came to be in the uterus, inquiries elicited the fact that a few days before her confinement the patient had been suffering from dysenteric symptoms, and, in view of her condition had not taken any medicine. It is probable that the worm managed to migrate after delivery from the rectum to the vagina, and that there it died and became putrid.—*Lancet.*

PÆDIATRICS.

TETANUS NEONATORUM OF ST. KILDA

St. Kilda is a small island of the Hebrides group on the West coast of Scotland. It lies far out at sea, and the population consists of but eighteen families. From time to time the prevalence of tetanus neonatorum on the island has been noticed. A description of the disease has recently been published by a nurse who has spent a year on the island. Not more than one out of every four our five children born survives, the vast majority succumbing to this terrible malady. The trismus generally appears at about the fifth or sixth day, and coincides in its commencement with the separation of the umbilical cord. At birth the children look plump and healthy, and, so far as can be seen, no abnormality is present at the umbilicus either before or after separation of the cord. The illness begins with a low, whining cry, and usually terminates in death within twenty-four hours. The child is seized with a series of opisthotonic convulsions, in which the fists are clinched, the jaws tightly closed, and the spine curved. The fits recur every quarter of an hour until death from exhaustion takes place.

The natives are not robust. They live in small, dirty, ill-ventilated houses, with every condition favorable to the development of the disease.—*Boston Med. and Surg. Jour.*

MODERN DRUGS IN THE TREATMENT OF PERTUSSIS.

An abstract in *La Pratique Médicale*, June 22d, 1891, makes a resumé of the modern drugs employed in treating whooping-cough. Von Genser was the first to advocate antipyrin, reporting 120 cases thus treated with a mean duration of twenty-four days. Rothe, who had observed some unfavorable results with antipyrin, advocated a combination of iodine and carbolic acid in the following formula:

℞ Carbolic acid.
Rectified spirits, aa.....gr. jss.
Tinct. of iodine.....gtt. x.
Tinct. of belladonna.....gtt. xxx.
Peppermint water.....f ℥ ij.
Syrup of poppies.....gr. xv.

To a child 2 years old a coffeespoonful of this is given every hour.

Love, of St. Louis, has published fifty cases satisfactorily treated with antifebrin in doses of one-half to five grains, according to age, four times daily.

Heiman has found phenacetin, in doses of one and one-half grains, for a child 3 years old, to be efficient, even when antipyrin had failed.

In 1885, Moncorvo prescribed a local treatment with resorcin, a method which was followed by Bouchut, Callias and Moriac. Several other modern cures may be mentioned to complete the list: sulphurous acid, employed by Mauby; bromoform, by Stepp, Loewenthal and H. Neuman; chloroform water, by Stepp and Shilling; terpin hydrate, by Manassé; and, finally, ouabaine,

recommended in England by Gammel.—*Univ. Med. Mag.*

THE USE OF STROPHANTHUS IN CHILDREN.

Demme reports (*Jahrbuch f. Kinderheilk.*, xxxi., Nos. 1 and 2) that a 1:20 preparation of tincture of strophanthus produces a strengthening of the systolic contraction of the frog's heart somewhat less decided than is produced by digitalis. This effect can be sustained a long time by careful dosage, but as the dosage is increased the contractile force diminishes and gradually a cessation in systole results. The toxic effect of strophanthus on the heart-muscle may occur unexpectedly and more suddenly than with digitalis, hence the necessity of great caution in administering the drug to children. Strophanthus also causes a prolongation of the diastole and a diminution in the frequency of the pulse as long as the energy of the systole increases. The author used the drug in seven cases of uncomplicated mitral disease, in five of scarlatinal nephritis, in three of exudative pleuritis, and in two each of bronchial asthma, pulmonary tuberculosis, and whooping-cough in children between five and fifteen years of age. Dyspepsia was produced in the younger children, so that the treatment could not be continued. The initial dose for children from five to ten years of age was one drop, three times daily; for older children, one drop four times daily. After four to seven days the dose was increased to three drops four or five times daily. Nausea and cold-sweating indicated a suspension of the treatment and the administration of wine, cognac, or coffee. In heart-failure diuresis was increased after three or four days, the pulse becoming slower and stronger and the breathing easier. The dropsical phenomena became less marked. The diuretic effect ceased after three or four days in five of the cases of mitral disease, and compensation could be affected only by the combined action of strophanthus with digitalis. A prompt diuretic effect was produced by strophanthus in two of the cases of chronic scarlatinal nephritis, while in the acute cases no benefit was experienced. The effect in exudative pleuritis was satisfactory, and also in the two cases of bronchial asthma, in which strophanthus was given in connection with iodide of potassium. In pulmonary phthisis no positive result was observed, but in the two cases of whooping-cough, in which there was persistent dyspnœa and œdema of the lower extremities in consequence of dilatation of the heart, the results were satisfactory. The action of strophanthus consists in elevation of the blood-pressure and favorable influence upon the respiratory centre. It can complete the action of digitalis when both drugs are given, and neither cumulative effect nor diminished activity were observed in cases in which it was used during a long period.—*Amer. Jour. Med. Sci.*

HYGIENE.

INOCULATION OF A JAPANESE WITH SCARLET-FEVER GERMS.

A. S. Ashmead, M. D., reports in the *New York Medical Journal*, September 5th, some interesting experiments made with the object of obtaining a modified lymph to prevent scarlet-fever in the Caucasian. He reports two tests of this vaccination as follows:

On May 17th I inoculated with scarlet-fever germs a native of Nagona-Ken, Japan, aged twenty-four years, three years resident in this country. There was no family history of syphilis or leprosy. The germs were taken from the desquamations on the forearm and palm of a German child, aged two years and three months, a patient of Dr. Ernst F. Ruppe. I took them on the twenty-fifth day, pursuant to a suggestion of Professor Edington, of Edinburgh. They were inserted in the left forearm.

The result of this was the development of an areole of intense scarlet, severe inflammation of throat and fauces, headache—but very slight elevation of temperature.

In a second case Dr. Ashmead states: In this second attempt I have produced a condition which may or may not be a modification of the disease, but certainly is not the disease itself.

This case was exhibited, on the sixth day after inoculation, to Drs. Lester and Wolff, at the Willard Parker Scarlet-Fever Hospital. I gave Dr. Lester some of the lymph from the arm. On the seventh day after inoculation the case was exhibited at the Hoagland Laboratory, Brooklyn, to Drs. Bristow, Van Cott and Dickinson. Dr. A. T. Bristow received various products for bacteriological culture, namely, blood from the areola, lymph from beneath the crust, and specimens of the crust itself. I have since left with Dr. Edson, Chief of Contagious Diseases Bureau, New York Board of Health, and Dr. Lester, portions of the

crust. I intend to inoculate this case again with scarlet-fever germs, obtained as before, and note whether the same results will follow.

I may observe that during the whole time of the experiment the patient was in continual relation with my own children, without any contagion taking place.

I have a half-breed child (Japanese and American), aged four, a foundling, whom I intended to inoculate with pure scarlet-fever virus. Dr. Joseph William Stickler, whose investigations in this line are well known, wrote to me in regard to this case: "I do not consider it safe to do such a thing, unless you are certain that the virus has been attenuated in strength to a degree that will render it a safe agent to use; yon cannot tell prior to inoculation just how susceptible your subject may be. Hence the impression made upon the system may be very severe, or very moderate. It may be severe enough to cause death."

I therefore do not feel justified in making this attempt. But perhaps the presumably attenuated virus obtained from my Japanese subject may be used with safety.—*Med. Age.*

ON TAKING FLUID WITH MEALS.

A great deal of misapprehension is often found to exist in the popular mind in regard to matters of eating and drinking; the cause of this to some extent is to be traced to old time sayings, which have come down to us in the form of a concentrated infusion of somebody's opinion upon a subject of which he or she was wofully ignorant. One of these misapprehensions to which we may refer is as to the injuriousness of taking fluid with meals. One frequently hears it laid down as a maxim that "it is bad to drink with your meals, it dilutes the gastric juice." By way of explanation we may remark that "it implies that the fluid taken is harmful." Whence this sagacious postulate originally came we cannot tell; it has quite the ring about it of an inconsequent deduction formed by a person whose presumption of knowledge was only exceeded by a lamentable ignorance of the subject. Medical men often find much difficulty in dealing with these museum specimens of antiquated science, for even educated persons are disposed to cling to the absurdities of their youth. Upon this matter Mr. Hutchison's remarks in the last number of his *Archives*: "I observe with pleasure that the verdict of general experience and common sense has been confirmed by scientific experiment in the matter of taking fluid with meals. Dr. Tev. O. Stratievsky, of St. Petersburg, after elaborate trials, has found that fluids materially assist the assimilation of proteids, and announces the following conclusion, which is to be hoped no future experiments will controvert—on the whole, the widely-spread custom of taking fluids during or just before one's meals, proves to be rational and fully justified on strict scientific grounds. To take fluids with the meals is almost as important an adjunct to digestion as is the mastication of solid food preparatory to swallowing it." It is obvious, however, that there is a limit to the amount of fluid one can swallow with impunity—not to speak of comfort—just as much with meals as at other times. It would be dangerous to create a general impression that fluid is good with food irrespective of quantity. It is, moreover, a well-ascertained clinical fact that an access of cumprandial fluid does retard digestion in certain people, and gives rise to discomfort in most. A little attention to one's sensations in such matters will far better fix the desirable limit than all the "data" in the world.—*Med. Press.*

HANDWRITING AND HYGIENE.

It will be remembered that at the late International Congress of Hygiene and Demography, in Section 4, which was concerned with the Hygiene of Infancy and School-life, a resolution was passed in favor of the teaching of upright penmanship or vertical writing, on the ground that spinal curvature and short sight are caused by the faulty position of the youthful student, which is necessitated by the slope of the letters. We can all of us remember the trouble of learning to write, and the mental and physical toil which the making of our first pothooks and hangers involved. The number of muscles put in action when a person is writing is prodigious, and it is probable that in beginners every muscle of the body must yield its assent before the graphic symbols trickle from the pen. The fingers, wrist, elbow, and shoulder must all be held steady. The spine must be rigid and fixed below as well as above. The pelvis must be firm, and to this end the child often gets a support by its feet from the legs of the chair. The thorax is more or less rigid, and its movements are determined more by the work of the hand than the respiratory needs. Lastly, the knit brows and protruding tongue are unconscious muscular acts which serve to mark the effort, both of body and

mind, which the child undergoes when learning to write. It is notorious that in writing our individuality asserts itself in spite of the pedagogue. We are taught certain rules for sitting at the desk and holding the pen, which we ultimately learn to neglect, and finally write in a fashion of our own. The great drawback of writing as an exercise for children is the fact that it involves one-half of the body only, and the necessity of fixing the spinal column causes the child instinctively to loll upon its left side while the right arm is working. To what extent the asymmetry of posture is caused by the fashion of sloping the letters it would be difficult to say, but there can be no doubt that the writing master ought to carefully watch the attitude of the child and endeavor to make it sit square to the desk and maintain the spinal column vertical. Every child should have a footstool to give firm support to the feet, and the seat should not be slippery, so that the fixation of the pelvis may be easy. Vertical writing is very legible, and if it diminishes to any extent the tendency to sit "lop-sided," it ought to be encouraged. The true remedy for the evils produced by learning to write seems to us to be to teach the child to use both hands, and to practice alternately with either hand. Vertical writing lends itself more readily to ambidexterity than does sloping writing, and there can be no doubt that a clerk who could write with equal facility with either hand, and could rest one side of the body while the other was working, would be little liable to writer's cramp and similar troubles. Seeing how enormous is the muscular effort involved in giving the hand sufficient steadiness, and that the brain fag is scarcely less than the muscle fag, it goes without saying that writing lessons should at first be of very short duration. Ten minutes with each hand ought to amply suffice.—*Lancet.*

MEDICAL CHEMISTRY.

DETECTION OF TIN IN CANNED FOOD.

H. A. Weber, Ph. D., has investigated the canned foods of the market, and found all of those examined by him, except condensed milk, to contain *tin.*

The method employed in the determination of the tin was as follows:

The contents of each can were emptied into a large porcelain dish, and the condition of the inner coating of the can noted. After thoroughly mixing the contents, 50 grains were weighed off and incinerated in a porcelain dish of suitable size. The residue was treated with a large excess of concentrated hydrochloric acid, evaporated to dryness, moistened with hydrochloric acid, water was added, and the mass was filtered and washed, the insoluble matter being all washed upon the filter. After drying the filter with its contents, the whole was again incinerated in a porcelain dish and the residue treated as before. The solution thus obtained was properly diluted and saturated with hydrogen sulphide. After standing about twelve hours in a covered beaker, the precipitate was filtered off, incinerated, and the tin weighed as tannic oxide.—*Journ. Am. Chem. Soc.*

THE PURITY OF PHENOCOLL HYDROCHLORATE AND OTHER SALTS.

Phenocoll hydrochlorate having commenced to be in some demand as a combined antipyretic and anodyne, it may be useful to record one or two tests for its purity and that of other salts of phenocoll. It is stated (*Pharm. Zeit.*, September 19th, p. 586) that half a grain of phenocoll hydrochlorate should dissolve clear in about 12 c.c. of water, and that the solution should not turn ordinary litmus paper blue. Solution of ferric chloride should produce in the phenocoll hydrochlorate solution only the faint yellowish color of iron salts, but not a red coloration even upon warming.

Heated to 60° C. and treated with a few drops of solution of sodium carbonate, the aqueous solution should not give off the odor of ammonia; with a few drops of caustic soda solution the phenocoll base should be thrown down as a white crystalline mass. Burnt on platinum, phenocoll hydrochloride leaves no residue.

For the acetate the same tests apply, except that the aqueous solution is faintly alkaline and the behavior with ferric chloride is not the same. The free base melted under water and allowed to cool solidifies in crystals; it is also precipitated from a dilute aqueous solution by sodium chloride in long, silky needles. Melted with caustic soda, ammonia and phenetidin are formed, and when an aqueous solution is boiled with a few drops of hydrochloric acid for a few minutes it shows faintly the reactions of phenacetin treated similarly.—After *Pharm. Journ.*

PURIFICATION OF THE NILE WATER BY BOILING, IN THE MIDDLE AGES.

Ebn-Radouan-el-Masry, writes Dr. Elouï-Bey in a paper in the *Lyon Medical*, an Egytian physician who flourished in the fifth century after the Hegira, writing A. D., 1068, says:

"The waters of the Nile, to be fit to be used for alimentation, should be drawn where the current is swiftest, for they then contain the least quantity of decomposed matter in suspension, as in the locality known as Rhom-el-Ahmar (now known as Old Cairo), just above Gihzeh."

"The water thus drawn should be submitted to especial operations for its purification, according to the temperament of the consumers. For those who are oppressed with the summer heat, it will be found useful to clarify it by stirring into it chalk, Armenian bole, the bruised seed capsules of the lotus, and vinegar. Those who feel the cold of winter severely prefer to use bitter almonds, thyme, anise, etc. After letting it stand until everything in suspension is carried to the bottom by the clarification above mentioned, the water should be decanted, and is then ready for use."

"It may also be purified by simply filtering it through vessels of unglazed pottery. Another means of purification consists of heating the water over the fire and subsequently exposing it to the night air. If all impurities are not thrown down to the bottom of the vessel, decant the clear part and boil it again. If after this second cooking the water still has a disagreeble taste, it should be brought to a boil, exposed to the night air, and finally clarified by some of the means mentioned above.

"But the best means of freeing water from all principles hurtful to health is without doubt to boil it, to expose it afterward to the cool night air, decant from the sediment, boil again, to purify by one of the means first mentioned, and finally to filter through a filtering vase exposed to the night air. Water thus treated is fit to be used as an aliment. Such water should be preserved during the summer in vessels of burnt clay, or of cooked earth made in the month of Touba (January), in leather vessels of Hedjah, or in any other refrigerating vessel. In summer, water for the day's use should be exposed on the ground floor with the windows opening to the north."*

"But in winter it should be kept, by preference, in warm places, in glass vessels, or clay vessels made in summer time.

"To make water more refreshing we may mix with it a little rosewater, or, better still, put a little chalk into it, the seeds of the white poppy, or of *moghra* (mixture of iron oxide and clay), tied up in a bit of linen in such manner that the water can acquire freshness by contact with these substances without being rendered muddy by them.

During summer time all vessels destined to contain water should be frequently cleansed by first rubbing with broken pottery, and then by barley flour, purslane, and sandalwood. Finally, they should be submitted to fumigations of camphor and sandalwood. In winter such vessels should be rubbed with alkalies and rushes, and fumigated with gum mastic and *aloud* (a resinous wood having an odor resembling guaiac).

"Nile water becomes completely unfit for drinking purposes at the time of the overflow, and when the current becomes very slow at the decrease of the waters. In these two cases it should be boiled and clarified with extra care, and bitter almonds and other substances which destroy its viscosity should be used for its clarification.

"The Nile furnishes, on the contrary, water of excellent quality at all points, during the month of Touba, or in full winter. The Egyptians are not slow to find this out, and a great many of them draw sufficient to keep them in supply for the remainder of the year. They preserve it in large vessels of glass or porcelain. They claim that it is insusceptible of deterioration, and consequently take no precautions of purification of it, maintaining that it is always good. But thou must not follow their example. Take no faith in their say-so, and clarify the water whatever be its state, since thou must know that water thus kept is undoubtedly subject to alteration."

So far we quote Ebn-Radouan. Pasteur, Koch, and their disciples of to-day, after having studied the matter with all the aids of science and all the instruments of our civilization have gotten but little further. Their dictum is to *filter and expose to heat* all waters from open rivers to be used for human alimentation. Ebn-Radouan was 830 years ahead of them.

*The north wind in Egypt, blowing over the Mediterranean and from the cooler European shores, is the most refreshing.

PIPERAZINE AND PHENOCOLL

Are now sometimes given in combination, phenocoll as a symptomatic, to allay pain, piperazine as the curative by virtue of its solvent action on uric acid.

NEWS AND MISELLANY.

THE LATE DR. S. R. KNIGHT.

At a meeting of the present and former members of the medical staff and ex-residents of the Episcopal Hospital held at the College of Physicians, November 21st, the following minute was adopted:

"The present and past members of the medical Staff of the Episcopal Hospital and its former resident physicians desire to express the deep regret which the death of Dr. S. R. Knight has caused them. All of the many who have been associated with him in his long service as Superintendent of the Hospital feel that they have lost a sincere and honest friend. They remember the kindly advice, the shrewd help and counsel that he had always ready for their difficulties, professional and personal, his constant interest in all the varied work of the institution, and the wisdom with which he made his own duties at once an example and an opportunity to the younger men in the sphere of their labors."

MANUFACTURED EGGS.

The contribution which the hen makes to breakfast possibilities would seem hard to imitate, yet it is freely stated in English journals that the industry of manufacturing eggs has attained large dimensions in that country, and further, that the manufactured article is for most purposes as good as the genuine.

THE AREA AND POPULATION OF THE GLOBE.

The recent publication of the *Bevölkerung der Erde*, of Drs. Wagner and Supan, by Perthes, of Gotha, gives us the most reliable information as to the area and population of the earth now obtainable. The estimate for the total population of the earth in this present year is 1,480 millions, or an increase of 46 millions over the estimate for 1882, when the last edition of these statistics was published. The exact enumeration of 835 millions (about 56 per cent. of the whole population of the globe) has now been accomplished by census or registration. The population of the chief divisions of the globe is, in round numbers: in Europe, 357 millions, giving 94 inhabitants to each square mile of area; Asia, 825 millions, or 47 to the square mile; Africa, 163 millions, or 14 to the mile; America, 121 millions, or eight to the mile; Australia, 3 millions, or 1 to the mile; and in the Oceanic Islands, 7 millions, or 10 to the mile. In Europe, Belgium exceeds all other countries in density of population, with 530 persons to a square mile; next follows Holland, with 365; and the United Kingdom, with 312; but whereas in England the density is 480, in Scotland it is only about one-fourth, and in Ireland about one-third that of England. In Norway and Finland, the most thinly populated countries of Europe, there are only about 16 persons to the square mile. Of China the estimate is 361 millions, giving a density of about 77 to the square mile. It is in respect of Africa that the greatest doubt necessarily exists. These statistics make it manifest that there are still vast areas of the habitable surface of the earth almost, if not quite, unpeopled; and which will for many a long year to come receive the surplus millions of Europe and other parts of the globe in which the density of population is most keenly felt.—*Brit. Med. Jour.*

A BUDDHIST TREATISE ON MEDICINE.

All those interested in the history of medicine, and particularly Indian medicine, will hail with scholarly delight, says the *British Medical Journal*, the announcement that an old Sanscrit treatise on the healing art has recently come to light under somewhat remarkable circumstances. The "find" is in itself hardly of such value as the work of Aristotle not long ago exhumed from the grave of oblivion in which it had lain so long entombed; but your true Dryasdust cares little for the literary or scientific quality of his treasure trove, if it but have the consecrating seal of hoary antiquity upon it. Last year, it will be remembered, Lieutenant Bower was fortunate enough, in the course of an exploring expedition in Kashgaria, to light upon a buried city in the neighborhood of Kuchar. Among the other antiquarian treasures found there was an ancient birch-bark manuscript, which was presented to the Asiatic Society of Bengal. The manuscript, which consists of thirty-three leaves closely written over on both sides, is in Sanscrit verse, and in the character known as the Nagari alphabet, of which three varieties occur in different parts of the work. The manuscript has been translated by Dr. Rudolph Hoernle, and appears to be a compendium of medicine, bearing the title of "Navanitaka," and divided into sixteen chapters. The author seems to have been a Buddhist, but, with a modesty not always found among medical writers, he has concealed his name so carefully that Dr.

Hoernle has not, up to the present, succeeded in discovering it. The work is divided into sixteen chapters, which are devoted to clysters, elixirs, eye-washes, hair-dyes, bitumen, castor-oil, women and children, etc. The prescriptions which are given in verse, recalling to the profane mind the gnomic scraps of clinical and therapeutic lore quoted by Albert Smith in his "Physiology of the Medical student," celebrate the wondrous effects of clarified butter, which our Buddhist brother seems to have considered the "sovran'st thing on earth" for all manner of bodily ailments. A draught containing this panacea, together with oil, treacle, vinegar, and ginger, will, we are assured, instantly conjure away the most acute lumbago. An ointment composed of thickened goat's milk and wheat flour, to which sesamum may with advantage be added, is a specific for gout and rheumatism. In addition to the pharmacological and therapeutic precepts which the work contains, the reader has, it need hardly be said, a goodly *armamentarium* of charms and spells of approved efficacy applied to him, so that if medicine fails, recourse may be had to the "faith cure." The date of the manuscript is fixed by Dr. Hoernle between 450 and 550 A. D. It is thus, so far as is known, the oldest Indian written book in existence.—*Med. Rec.*

SCHENCK'S PULMONIC SYRUP.

It is said that Schenck's Pulmonic Syrup consists of wormwood, catnip, tansy, hyssop, hoarhound, hops, chamomile, comfrey, senega and elecampane, of each four drams. Boil with sufficient water to make, after straining, one quart; add gum arabic one and one-half ounce, and licorice one and one-half ounce. Then add one good sized Indian turnip, and finally sugar three pounds, brandy one-half pint, juice of two lemons. This is evidently based on a poly-pharmaceutical perscription of the early nineteenth century.

SYPHILIS IN THE UNITED STATES.

It is stated on good authority that the number of persons affected with syphilis in the United States at the present time is about 2,000,000.

At the close of the World's Fair at Paris, it was stated that that city had within its limits, 50,000 women with syphilis. We have no means of knowing how many syphilitics there were in America before the World's Fair, or how many so afflicted resided in Paris before that eventful period, or neither are we able to estimate the number of persons from America who visited Paris on that occasion; hence we can only dismiss the subject after having stated facts and figures, as it is our duty to do.—*Med. Rev.*

THE CONSUMPTION OF TOBACCO IN FRANCE.

Last year French smokers consumed 4,600,000 francs worth of cigars, 10,000,000 of cigarettes, 29,000,000 of snuff, and 91,000,000 worth of pipe tobacco. The greatest snuff-takers are old peasant women and priests. Snuff is often allowed to Sisters of Charity, as it renders the nose insensible to the bad smells of slums and hospitals, and acts as a disinfectant of the air taken in by the nostrils. The greatest number of pipe-smokers are along the coast from Nantes to Calais. Fisherwomen as well as sailors use the pipe. The consumption of ladies' cigarettes rose from 101,900 francs to 800,000 francs last year, and the orders received at the tobacco manufactory promise a still further increase under this head. There is one anti-tobacco society in France.—*The Sun.*

WILD AND CULTIVATED HERBS.

At the recent meeting of the German Scientific Congress Dr. Schweissinger, of Dresden, read a paper dealing with the examination of a few narcotic herbs, showing the effect upon their alkaloidal value. The results obtained, so far as henbane is concerned, practically corroborate Mr. Gerrard's work. They are as follows:

	Per cent. alkaloid.
Herb. aconiti, wild	0.58
" " cultivated	0.60
" belladonnæ, wild	0.40
" " cultivated	0.17
" hyoscyami, wild	0.085
" " cultivated	0.070
" stramonii, wild	0.32
" " cultivated	0.26

Dr. Schweissinger extracted the herbs with water acidulated with sulphuric acid, evaporated, removed pectin by filtration, then added ammonia, and extracted the alkaloid with ether-chloroform, checking the result by titration. In the course of the discussion it was stated that wild stramonium is preferred in Germany, and Mr. Dieterich mentioned that cultivated belladonna and henbane yield not only very good extracts, but extracts which are rich in alkaloid.—*Chem. and Drugg.*